Document of
The World Bank

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Report No: 34140-TU

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF
US$ 325 MILLION

TO

BORU HATLARI İLE PETROL TAŞIMA A.Ş.
(BOTAŞ)

WITH THE GUARANTEE OF THE REPUBLIC OF TURKEY

FOR A

GAS SECTOR DEVELOPMENT PROJECT

OCTOBER 31, 2005

Infrastructure Department
Europe and Central Asia Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective October 27, 2005)

Currency Unit = New Turkish Lira (YTL)
1.35 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

APL	Adaptable Program Loan
BCM	Billion cubic meters
BOOs	Build Own and Operate Power Plants
BOTAŞ	BORU HATLARI İLE PETROL TAŞIMA A.Ş. (Turkish Pipeline Company)
BOTs	Build Operate and Transfer Power Plants
BTC	Baku-Tbilisi-Ceyhan (Crude oil import pipeline)
CFAA	Country Financial Accountability Assessment
DSI	Devlet Su İşleri (State Hydraulic Works)
E&C	Engineering and Contracts department of BOTAŞ
EA	Environmental Assessment
EC	European Commission
ECSEE	Energy Community of South Eastern Europe
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMRA	Energy Market Regulatory Authority
EPDK	Enerji Piyasası Düzenleme Kurumu (EMRA in Turkish)
ERP	Enterprise Resource Planning program
EU	European Union
EUAS	Elektrik Üretim A.Ş. (Electricity Generation Corporation, Turkey)
FAD	Finance and Accounting Department
FEA	Finite Element Analysis
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFC	International Finance Corporation
IPE	International Petroleum Exchange
LNG	Liquefied Natural Gas
MENR	Ministry of Energy and Natural Resources
MOEF	Ministry of Environment & Forestry
MOF	Ministry of Finance
NGML	Natural Gas Market Law
PPIAF	Public-Private Infrastructure Advisory Facility
SEE	State Economic Enterprise
SIL	Specific Investment Loan
TEIAS	Türkiye Elektrik İletim A.Ş. (Turkish Electricity Transmission Corporation)
WACOG	Weighted Average Cost Of Gas

Vice President:	Shigeo Katsu
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Sector Manager:	Lee Travers
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TURKEY

GAS SECTOR DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

EUROPE AND CENTRAL ASIA

ECSIE

Date: October 31, 2005	**Team Leader**: Ranjit J. Lamech
Country Director: Andrew N. Vorkink	**Sectors**: Oil and gas (100%)
Sector Manager: Sumter Lee Travers	**Themes**: Public expenditure, financial management and procurement (P)
Project ID: P093765	**Environmental screening category**: Full Assessment
Lending Instrument: Specific Investment Loan	**Safeguard screening category**: Limited impact

Project Financing Data

[X] Loan [ ] Credit [ ] Grant [ ] Guarantee [ ] Other:

For Loans/Credits/Others:
Total Bank financing (US$m.): 325.00
Proposed terms: FSL

Financing Plan (US$m)

Source	Local	Foreign	Total
BORROWER	77.00	136.00	213.00
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT	50.00	275.00	325.00
Total:	127.00	411.00	538.00

Borrower:
BOTAS
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A-2 Blok, Bilkent
Ankara
Turkey
06530
Tel: +90 312 297 2295 Fax: +90 312 266 0619

Responsible Agency:
BOTAS
Turkey

Estimated disbursements (Bank FY/US$m)									
FY	2006	2007	2008	2009	2010	2011	2012	2013	0
Annual	24.00	66.00	77.00	35.00	50.00	20.00	28.00	25.00	0.00
Cumulative	24.00	90.00	167.00	202.00	252.00	272.00	300.00	325.00	325.00

Project implementation period: Start March 15, 2006 End: June 30, 2015
Expected effectiveness date: February 28, 2006
Expected closing date: December 31, 2012

Does the project depart from the CAS in content or other significant respects? ***Ref. PAD A.3***	[ ]Yes [X] No
Does the project require any exceptions from Bank policies? ***Ref. PAD D.7***	[X]Yes [ ] No
Have these been approved by Bank management?	[X]Yes [ ] No
Is approval for any policy exception sought from the Board?	[ ]Yes [X] No
Does the project include any critical risks rated "substantial" or "high"? ***Ref. PAD C.5***	[X]Yes [ ] No
Does the project meet the Regional criteria for readiness for implementation? ***Ref. PAD D.7***	[X]Yes [ ] No

Project development objective ***Ref. PAD B.2, Technical Annex 3***
The Project objective is to increase the reliability and stability of gas supply in Turkey by implementing critically needed gas storage and network infrastructure, and support BOTAS in strengthening its operations as a financially stable and commercially managed corporation.

Project description *[one-sentence summary of each component]* ***Ref. PAD B.3.a, Technical Annex 4***

1. The Tuz Golu underground gas storage facility which will include:
   (a) surface and sub-surface facilities including engineering and construction, solution mining, the gas pipelines and the compressor facility;
   (b) The water and brine discharge pipelines;
   (c) Cushion gas; and
   (d) Consulting services including an Owner's Engineer, environmental monitoring and regulatory aspects.

2. Network expansion, which will include two compressor stations for BOTAS at Erzincan and Corum.

Which safeguard policies are triggered, if any? ***Ref. PAD D.6, Technical Annex 10***
Environmental Assessment (OP/BP/GP 4.01)
Involuntary Resettlement (OP/BP 4.12)
Safety of Dams (OP/BP 4.37)

Significant, non-standard conditions, **if any**, for:
Ref. PAD C.7
Board presentation:
There are no conditions for Board presentation.
Loan/credit effectiveness:
There are no effectiveness conditions.

Covenants applicable to project implementation:

Financial Covenants

(a) BOTAS will maintain a debt service coverage ratio of not less than 1.2 every year from 2006.

(b) BOTAS will achieve a self financing ratio (funds from internal resources as a proportion of the three-year average capital expenditure) of not less than 15% in 2007, and not less than 25% every year from 2008.

Regulatory Covenants

(a) BOTAS will submit to EMRA by January 31, 2009 a regulatory proposal which will cover the following aspects:

- Approach for setting tariffs for the storage business including an acceptable rate of return on the regulated asset base;
- Determination of the regulated asset base for transmission and storage on a depreciated replacement cost basis which adequately compensates for domestic and international inflation.

(b) BOTAS shall make the Weighted Average Cost of Gas (WACOG), available to the Bank on a monthly basis to be applicable for wholesale purchases.

Financial Management Covenants

(a) BOTAS will maintain a financial management system acceptable to the Bank.

(b) BOTAS will install and make functional the enterprise resource planning program (ERP) by December 31, 2007.

TURKEY
GAS SECTOR DEVELOPMENT

CONTENTS

A. STRATEGIC CONTEXT AND RATIONALE

1. Country and sector issues

Turkey has gone through a number of economic crises in the recent years, and consequently embarked upon a path of economic and financial recovery. Since 2001, GNP has grown at a fast pace, by 5.9% in 2003 and 9.6% in 2004. The inflation rate has been in single digits for the first time in many years in 2004. Other indicators of economic performance such as the debt to GNP ratio are also improving. Turkey is also scheduled to begin negotiations for accession to the European Union in October 2005, an indicator that its program of reforms is being sustained.

The energy sector, and particularly the natural gas sector, is a key driver in Turkey's economic recovery. Natural gas consumption has grown rapidly in Turkey over the past two decades – with an average annual growth rate of 24%. The largest user of gas is the electricity generation industry, but considerable amounts are also used in industry, commerce and increasingly, households. Growth has naturally stabilized as the market has grown and the current decade has seen demand growth average 10% per year. With increasing urbanization, and the resulting increase in the requirement for electricity and for heating, the demand for natural gas is expected to continue to grow rapidly in the medium term. At present about 70% of the Turkish population lives in urban areas, and this is expected to grow to 85% over the medium term. Along with urbanization, more and more cities are being connected to the gas transmission grid. Until recently only 5 cities had gas distribution systems (Ankara, Istanbul, Izmit, Bursa and Eskisehir). In the past year EMRA, the Energy Market Regulatory Authority, has awarded 26 licenses for gas distribution companies in hitherto unconnected cities. In addition to raising the demand for gas, this is also likely to raise the need for gas at peak periods, the winter months, because a large part of gas consumption is for heating purposes.

Turkey obtains its gas supplies through imports, primarily from Russia through two pipelines, one through Bulgaria and the second one under the Black Sea. Other major gas suppliers to Turkey are Iran (by pipeline) and Algeria and Nigeria (in the form of LNG). Deliveries of gas from Azerbaijan are expected to begin in late 2006. Turkey imported about 25 billion cubic meters (bcm) of natural gas and LNG in 2004.

Turkey, due to its unique geographical location, is well-placed to be a major gas transit country, exporting into mainland Europe. Turkey is already in negotiations to construct large pipelines which will take Russian and other gas imports into Europe. In addition to the growing in-country demand for gas, this role for Turkey as a transit country is likely to drive the economics of the natural gas market in the medium term.

Reforms in the Turkish natural gas sector are governed by the Natural Gas Market Law (No. 4646). The Law requires the sector to be restructured into a competitive market. As a result, BOTAŞ, the current monopoly importer, wholesaler and transmission system owner and operator, separated its gas distribution business into separate companies which have been privatized. In addition, EMRA, the regulatory authority, has awarded licenses to 26 new city distribution networks, and an additional 12 cities are scheduled to be awarded to private

investors in the near future. Under the Law, BOTAŞ is expected to reduce its share in gas imports and wholesaling to 20% by 2009. As discussed in the *Gas Sector Strategy Note* prepared by the Bank in September 2004, the timeframe envisaged in the Law is highly ambitious, and the program of contract release may also not be the appropriate alternative for introducing competition[1]. Eventually over the medium to long term, it is likely that BOTAŞ will operate as a gas transmission company, and will no longer remain a monopoly player, with independent importers and suppliers operating in the market. The timeframe for this structure however, is not certain yet.

Despite its size, and despite the rapid growth in demand, Turkey currently has no natural gas storage. Most developed countries normally maintain (or have access to) storage capacity adding up to a reasonable proportion of their annual consumption (see table below). The Law requires Turkey to have storage within the country to the extent of 10% of annual consumption. The lack of storage jeopardizes the security of supply and reliability of the gas system and also the power system, which depends on gas as a major fuel source. Given that Turkey is a winter-peaking system, the lack of storage leads to gas shortages in the winter, or dependence on other fuels, or the purchase of gas at high prices. In response to the need to improve its security of gas supply, Turkey has diversified its import sources as indicated above. However, this is likely to be insufficient, and adequate storage would contribute a vital component to the security and operational efficiency of the gas system. A storage facility is under construction at Kuzey Marmara, with a capacity of 1.6 bcm. This however, has a low gas withdrawal rate and may not be adequate to meet peak demand.

Underground Gas Storage in Various Countries 2002

Country	Total Consumption (BCM)	Number of Storage Facilities	Total Storage Capacity (BCM)	Storage Capacity/ Total Consumption
U.S.A.	622	417	110	18%
Russia	338	23	90	27%
Ukraine	69	13	34	49%
Germany	98	41	19	19%
France	59	15	12	20%
Italy	57	10	12	30%
Turkey	18	0	0	0
Turkey (2015)	42	2	2.4	6%

The project therefore, aims to assist BOTAŞ in building storage capacity in the country. In addition to storage, the project will finance critically needed compressor stations, which are

[1] A contract release program is underway right now, although the final date for submission of bids has been extended several times.

required to enable gas imports from existing and new sources to be transmitted through the system.

2. Rationale for Bank involvement

The Bank has been advising the Turkish Government on gas sector reforms and implementation strategy. In September 2004, in close collaboration with the Government, the Bank produced a *Gas Sector Strategy Note* and a *Gas Distribution Strategy Note* which provided key recommendations for the ongoing restructuring of the gas sector. The Bank has played a major role in assisting the Athens Process and helping the countries of South Eastern Europe including Turkey move towards open regional energy markets for electricity and gas. The Bank also prepared a paper entitled *World Bank Framework for Development of Regional Energy Trade in South East Europe*[2] which deals with the development of these markets.

Immediate challenges in the Turkish gas sector include:

(a) the lack of gas storage to meet peak seasonal and daily demand which could lead to disruptions in supply; and
(b) macroeconomic considerations of inflation and primary surplus targets that make gas sector pricing a Government policy tool – making reform and regulatory considerations a second order priority.

The Bank, by assisting in financing the Tuz Golu storage facility, will therefore address a key physical constraint in the sector and establish a policy dialogue that allows the balancing of macroeconomic imperatives with reform imperatives.

This project also has important regional implications. Turkey is rapidly turning into a key player in the European Gas Market through its potential as a key transit country. The first transit gas will come from Azerbaijan and will enter Turkey later this decade following the route through Azerbaijan and Georgia used by the BTC pipeline. Later, gas is expected to come from the Middle East to Turkey. Much of this gas will transit Turkey, initially to Greece but soon thereafter, with the construction of the Nabucco pipeline, the gas will go to Bulgaria, Romania, Hungary and eventually Austria, thereby feeding into the main European transmission system. The storage facility is expected to play a significant role in enabling Turkey to transit the gas to Europe, in addition to assisting in meeting the peak within the country.

BOTAŞ has the potential to operate commercially and access financing independently in the future. BOTAŞ, like all other state economic enterprises (SEEs), is controlled by the Government, and faces restrictions on borrowings and investments. It however, has the potential to operate commercially and over the medium-term gain access to financing on its own strength without government guarantees. This process will require both changes within BOTAŞ's financial and operating framework, as well as a focus on easing the macroeconomic policy restriction placed BOTAŞ by the Government. The Bank will assist on both fronts. From an internal BOTAŞ perspective the Bank is providing financial advice which will prepare BOTAŞ

[2] World Bank Paper No 12, March 2004 by David Kennedy and John Besant-Jones.

for a credit rating. Work on the credit rating is expected to start by October 2005. The Bank's support to BOTAŞ in this regard and on the regulation of the storage and transmission businesses is expected to enable BOTAŞ to operate in an increasingly commercial and financially independent manner.

3. Higher level objectives to which the project contributes

The project is consistent with the CAS (dated October 2, 2003). The CAS has identified the lag in the development of markets for gas as an issue in Turkey. The Project will ultimately enable further development of markets by improving the reliability and stability of the gas sector.

All of the countries of South Eastern Europe have the prospect of EU membership. Bulgaria and Romania are expected to join in 2007, and Turkey and Croatia are candidate countries. The Thessaloniki Agenda for the Western Balkans: Moving towards European Integration which was endorsed by the European Council in 2003 encourages the establishment of integrated energy markets in electricity and gas based on a common solidarity and consistent with the rules applicable within the European Union. The EC is also trying to ensure that all of the countries in South East Europe have access to stable and continuous energy supply which they regard as essential for economic development and social stability. The Tuz Golu facility and the expansion of compression capacity, through improving the reliability of the Turkey gas market and by strengthening its ability to integrate into the European gas market, would assist with these higher level objectives.

B. PROJECT DESCRIPTION

1. Lending instrument

This project will use a Specific Investment Loan (SIL). BOTAŞ has chosen a commitment linked fixed spread loan (FSL) with 7-year grace and 13-year final maturity. The FSL instrument has been chosen because it provides certainty on account of the fixed spread and also because it allows for a 7-year grace period which matches the project implementation schedule.

2. Project development objective and key indicators

> *The Project objective is to increase the reliability and stability of gas supply in Turkey by implementing critically needed gas storage and network infrastructure, and support BOTAŞ in strengthening its operations as a financially stable and commercially managed corporation.*

The key indicators that will be used to assess the performance of the project during implementation and at the end of the project are as follows (see also Annex 3):

- Completion of the storage facility (in three phases over the project period);
- Separation of storage into a separate business unit;
- Completion of the two compressor stations; and
- Financial performance indicators – profitability, debt service coverage, self-financing, receivables and payables.

3. Project components

The Project has two components. The first and largest component is the Tuz Golu underground gas storage facility. The second component comprises two compressor stations that BOTAŞ needs for its gas transmission system – Erzincan and Corum compressor stations, and other network infrastructure to assist in transmitting increased volumes of gas.

I. **The Gas Storage Facility** The gas storage facility will be in an underground salt formation located close to Tuz Golu, a salt lake in South Central Turkey. The facility will have 12 caverns which will be "solution-mined" in phases of four caverns each. The facility, upon completion, will have a storage capacity of about 960 million cubic meters of working gas and 460 million cubic meters of cushion gas[3]. The facility will have the capacity to deliver 40 million cubic meters of gas per day up to 20 days and can be refilled at the rate of 30 million cubic meters per day over a period of 25 days. The cushion gas however, must remain in the caverns as long as the storage facility is in operation in order for the caverns to maintain their structural integrity, given the pressure from the surrounding salt. This component will finance the following investments:

(a) The surface and sub-surface facilities including engineering and construction, solution mining, the gas pipelines and the compressor facility;
(b) The water and brine discharge pipelines;
(c) 460 million cubic meters of cushion gas (see Section 7); and
(d) Consulting services including an Owner's Engineer (for assistance in supervision and monitoring of implementation), environmental monitoring and regulatory aspects.

This component is estimated to take 10 years to complete. BOTAŞ was of the view that a loan with a 10-year disbursement profile would entail high costs for BOTAŞ in the form of commitment fees. Further, BOTAŞ would in all likelihood start repaying the loan while it was still disbursing. Given these factors, it was agreed with BOTAŞ that the Bank would finance the first two phases (8 caverns) over 7 years from 2006 to 2012, and that BOTAŞ would obtain other sources of financing for the remaining investments. The Bank may consider providing additional financing for the remaining investments, in case BOTAŞ required financing from the Bank.

The cushion gas sub-component is currently valued at US$ 80 million based on current gas prices. The actual value of this sub-component will be determined at the time of reimbursement. While the value can increase from current estimates, it is not likely to be large in relation to the cost of the project, and it is expected that BOTAŞ will be able to finance the incremental cost, if any.

II. **Network Expansion** The project will also finance two compressor stations for BOTAŞ at Erzincan and Corum and other network infrastructure. These stations are required to

[3] Working gas is the portion of natural gas in the caverns which can be withdrawn and injected back in, while cushion gas is the portion of gas which is required to remain in the caverns for the duration of their economic life in order to maintain cavern integrity.

help transmit the increasing volumes of gas expected to be imported into Turkey from existing and new sources. The Corum station will have a capacity of 30 MW and is required in order to enable increased supply from Russia, while the Erzincan Station will have 39 MW of compression capacity and will enable the import of natural gas from Azerbaijan.

4. Lessons learned and reflected in the project design

This project is the first gas storage for the Bank, and there is thus no close precedent within the Bank to follow on the technical aspects. Development of gas storage in salt deposits using the process of leaching (or solution mining) the caverns is however, a tested practice, and there is sufficient technical experience in this regard. The project also has some unique features, such as the financing of cushion gas. However, project design and preparation has benefited from the extensive experience that the Bank has in developing large infrastructure investment operations, and from the experience of specialized experts in the field of gas storage in salt deposits.

Focus on comprehensive feasibility and technical review The main lesson learnt and reflected in project design has been the upfront attention to a comprehensive examination of the feasibility of the project and the technical aspects. BOTAŞ contracted a highly skilled engineering consortium comprising E.ON Engineering (formerly PLE) and **PODZEMGAZPROM** (PGP) to prepare the feasibility study, which included using the findings from two wells drilled in the salt formation to determine the salt strength and confirm seismic evaluations. A Finite Element Analysis (FEA) was carried out based on the salt cores and seismic data. The project feasibility and basic design in terms of cavern configuration (size, shape, depth, etc) and operating parameters (injection, withdrawal rates, etc) are based on in-depth analysis. The Bank has conducted a separate FEA analysis and has reviewed the feasibility study with its own experts.

Independent risk analysis Apart from an independent review of the feasibility study and also a separate FEA, which confirmed the findings of BOTAŞ and their advisors, The Bank also carried out a review of the seismic risks related to the project (Turkey is a highly seismic country, and though the chosen site is the least seismic area of Turkey, the Bank nevertheless had a study done to ensure that there were no serious seismic risks). This study was carried out by Dr. Nafi Toksoz, Director of the Earth Resources Laboratory at the Massachusetts Institute of Technology (MIT). It confirms that the area has acceptable seismic risk and that the surface and subsurface facilities are adequately designed to withstand the anticipated seismic activity. The Project will also introduce monitoring equipment to monitor seismic activity (including induced seismicity) and its impact on the structures.

Upstream attention on safeguards The EIA prepared for BOTAŞ was reviewed by the Bank, and significantly revised and upgraded as a result of Bank suggestions. The Bank also requested a separate EIA for the water pipeline when the project design was altered as a result of public consultations. Since the leaching of the caverns is dependent on using water from the Hirfanli Reservoir the Bank's Safety of Dams (OP/BP 4.37) was triggered. The Hirfanli Dam was then inspected by DSI and by the Bank's own expert. In addition as part of the project it has been agreed that the dam will be routinely monitored and appropriate actions will be taken as required.

Regulatory issues Given the Bank's significant experience in regulatory issues across the world, but also specifically in the Turkish gas sector, and given the importance of establishing a reasonable regulatory framework for storage early in the process, the Bank has been in dialog with BOTAŞ and EMRA. As a result of the Bank's involvement, the regulatory framework is in the process of being developed, and will be approved by EMRA prior to the commissioning of the storage facility. EMRA is in broad agreement that storage will be accorded a reasonable rate of return on assets and that the asset base will be the depreciated replacement cost.

Flexibility in policy dialogue and recognition of macroeconomic priorities The project has chosen flexibility in carrying out the policy dialog on reforms in the Turkey natural gas sector, as opposed to use of hard conditions in the loan. This is also in recognition of the underlying dynamics external to the gas sector in Turkey where priority is being given to macroeconomic stabilization. The project will help continue the policy dialog with the Government and other stakeholders on reform implementation by ensuring that the objective of transitioning to a transparently regulated sector is not postponed longer than justified by macroeconomic considerations.

Prompt advice from Experts, Senior Management The project has benefited significantly from the use of prompt and timely senior management and expert resources. The team involved the Safeguard Coordinator and the Dam Safety Expert from an early stage, resulting in timely interventions and adequate focus on these important issues. The team also relied heavily on the Regional Procurement Advisor, the Senior Legal Counsel and OPCS, especially for difficult issues such as contracting/packaging, and financing of cushion gas.

5. Alternatives considered and reasons for rejection

Choice of Lending Instrument: The project is ideally suited for an investment operation. A Specific Investment Loan was chosen early in the identification and concept stage. Options of using a sector adjustment loan (SECAL) were deemed unsuitable given the complex physical infrastructure being financed for the first time by the World Bank and the need for the Bank to engage closely in preparation and implementation of these components.

Public versus Private Financing: The team and the Government reviewed the possibility of using the private sector to construct and operate the storage facility. This approach was not feasible because the necessary conditions for private sector investment were not in place. Specifically, the framework for regulating gas storage has not been finalized, which would pose a significant risk to the private sector and would require a full sovereign guarantee to back the financing and operations of a private facility. Attempting to finalize this framework would have delayed construction greatly, thus delaying the significant benefits that would accrue from the project.

Furthermore, the team determined that for the medium-term large-capacity central gas storage was a critical investment for supply security and that it would be more appropriate to let BOTAŞ, the transmission company, construct and operate the facility.

The team considered including strict conditionality on the implementation of the reform program, but chose to adopt a more flexible approach. This approach is based on experience with other projects which did not move fast enough and did not achieve the objectives because of the overlay of policy aspects. The team's current approach of engaging the Government directly on policy aspects has worked well so far.

Procurement Packaging for Gas Storage Component: The team and BOTAŞ reviewed in detail the benefits of going with the single EPC (Engineering-Procurement-Construction package) for the gas storage facility versus separating the contracts for the subsurface and surface facilities. The separation of these two main contracts was chosen in consultation with the experts, because the surface facility would have to be completed before the subsurface works could start. Furthermore, there were no major competitive gains to be had by combining these two contracts, since there are only a few experienced contractors for solution mining work while a number of companies can do the surface work. Though using separate contracts implies a slight risk of delays or problems in integration, these risks are thought to be small compared to the premium that contractors might charge for taking on both sets of risks in a combined contract.

C. IMPLEMENTATION

1. Partnership arrangements

PPIAF has provided a grant to the Bank which is being applied towards preparing BOTAŞ for a credit rating and thereafter obtaining a credit rating. In addition, the EU has provided a grant to BOTAŞ for preparing a regulatory framework for setting tariffs for BOTAŞ' businesses of transmission, storage and wholesale. The Bank has been advising BOTAŞ on these issues, and will coordinate with BOTAŞ to ensure that any assistance provided to BOTAŞ will be complementary to the work being sponsored by the EU.

2. Institutional and implementation arrangements

The Tuz Golu storage project is being prepared by BOTAŞ, and will be implemented by BOTAŞ under suitable contracts. BOTAŞ will be the borrower, with the loan guaranteed by Treasury. The project will also finance the *Owner's Engineer*, who will support BOTAŞ in supervising the design, tendering and construction of the project.

During the feasibility phase, BOTAŞ has been assisted by two highly competent engineering firms, E.ON Engineering (formerly PLE) and **P**ODZEM**GAZP**ROM (PGP). BOTAŞ has substantial experience in building, operating and maintaining pipelines. BOTAŞ also has experienced geologists and engineers among its staff who are responsible for the Tuz Golu facility.

BOTAŞ will manage the design and construction of the compressor stations. BOTAŞ has significant experience in constructing and operating compressors and its Engineering and Contract (E&C) Department will manage the procurement and implementation.

A Project Management Team has been set up under the coordination of the Engineering and Contracts (E&C) Department of BOTAŞ and will coordinate the implementation of the project, including monitoring of procurement, disbursements and periodic reporting requirements for the Bank loan. This team has also overseen the preparation of the feasibility study, the design and engineering of the storage project, the preparation of bidding documents for various project components and has also prepared the EIA/EMP and land acquisition plan. The team will be supported by experienced procurement staff during the procurement process.

3. Monitoring and evaluation of outcomes/results

BOTAŞ will submit to the Bank quarterly progress reports that will provide information on the progress towards achieving the outcomes and results that the Project aims to support BOTAŞ in achieving. Specifically, the reports will cover the following:

(a) Progress in implementation – procurement, disbursement, work completion;
(b) Progress in the financial and operational efficiency of BOTAŞ – financial ratios, operating ratios; and
(c) Progress in separating storage into a business unit.

In addition, the Bank will also continue to work with BOTAŞ, the Government and EMRA in supporting the development of competition in the gas industry. To this end, the Bank will monitor the introduction of competition in the gas market by BOTAŞ and EMRA.

4. Sustainability

The Project is designed to meet medium-term gas storage needs, but more importantly to establish the necessary technical and site-specific capacity to enable further development. The Tuz Golu facility is expected to be an extremely versatile facility, with the ability to expand storage in a modular fashion well beyond the initial 960 million m^3.

This facility is the first of its kind in Turkey, although underground gas storage is very well understood from a technical design and operational perspective in other parts of the world. Through this project, it is very likely that BOTAŞ will gain the expertise and the ability to expand underground storage capacity at Tuz Golu, and elsewhere in the country.

The Project is going to use internationally tested solution mining designs and technologies. BOTAŞ' advisors, E.ON Engineering have carried out finite element analyses (FEA) which have provided critical inputs into the cavern design. The Bank also carried out a parallel FEA which has confirmed the design. Before each cavern is developed, test drilling will be done, which will enable BOTAŞ and their contractors to modify the cavern design to suit the specific conditions at that site. It will also enable them to choose alternative sites, if so required.

The Project also carries low risk of operational failure. Salt has a unique self-sealing property, which enables it to withstand significant pressures, such as those caused by seismic activity. The caverns themselves therefore are very robust and they are being designed to take into account

local seismicity. The Bank has undertaken an independent seismic review of the area, by Dr. Nafi Toksoz, Director of the Earth Resources Laboratory at MIT, which confirms that the area has acceptable seismic risk, and that the surface and subsurface facilities are adequately designed to withstand seismic activity. The Project will also introduce monitoring equipment to monitor seismic activity and its impact on the structures.

The location of the compressor stations has been decided based on hydraulic flow analyses under various supply and demand scenarios. The Corum station is essential for enhancing the transmission system capacity to enable the Blue Stream (a pipeline under the Black Sea) to be utilized optimally. The Erzincan station is required to enable gas from Azerbaijan to reach load centers in Turkey and elsewhere.

All of these factors assist in ensuring the sustainability of the investments being proposed for financing under this Project, and also of the storage facility itself.

5. Critical risks and possible controversial aspects

Risk	Risk rating	Mitigation Measure
A. Regulatory and Sector Policy Issues		
A.1 Regulatory Risk - Inadequate tariffs	M	At the Concept Stage the team identified the regulatory risk stemming from a lack of specific regulatory policy for storage. This has since been effectively handled through policy dialogue with BOTAŞ and EMRA. The team has been working with BOTAŞ as well as EMRA to determine an appropriate tariff methodology for storage. EMRA agrees that storage will be regulated like transmission, and that it will be provided the same rate of return on assets (9.5%). EMRA has also agreed to treat cushion gas as part of the asset base. At this point, the price caps established by EMRA are actually much higher than the prices actually charged by BOTAŞ – therefore, tariff or regulatory risks are considered low.
A.2 Impact of delays in introduction of competition	N	There is a likelihood that the introduction of wholesale competition could be delayed beyond the 2005-2009 timeframe envisaged under the Natural Gas Market Law owing to: (a) the lack of private sector interest in the Government's gas import contract release process which the Bank had advised against; (b) the adequacy of existing import contracts to meet demand up to around 2012. However, the impacts of such a delay are not likely to be significant or long-term in nature. The Bank is in dialog with the Government and is assisting in implementing the Gas Strategy Paper of 2004. The Gas Strategy Paper noted that several of the wholesale market implementation targets established in the NGML were excessively ambitious and has recommended a revised implementation approach.
B. Impact of Macroeconomic Constraints		
B.1 Macroeconomic strictures: Primary balance and inflation target requirements	S	The Government has tried to keep consumer prices for natural gas low (by not allowing gas price increases to be passed through fully as a consequence of oil price increases), which has adversely impacted BOTAŞ' profits especially in the current year, when gas prices are increasing. The Project itself is unlikely to be affected by these constraints directly. However, the continued use of BOTAŞ gas prices as policy tools to achieve inflation targets can severely impact the ability to implement the planned regulatory framework as well as impact BOTAŞ cash flows adversely.
C. Technical Risks		

Risk	Risk rating	Mitigation Measure
C.1 Delays in construction	N	The risk of delays is not considered significant, even though a delay is possible either because of unexpected geology or because of lack of integration between the two main contractors (surface and subsurface works). Construction will be contracted under international competitive tender, and it is expected that the best suited contractors will be utilized. The contracts will also have suitable provisions protecting BOTAŞ against delays. BOTAŞ will also be assisted by a competent supervising consultant, who will ensure that the two contracts are appropriately integrated. The implementation plan also builds in a time gap between the surface and subsurface contracts, to ensure that there is enough time for integration.
C.2 Seismic risk	N	Turkey is a seismically active country, but the project site is in the least seismically risky area of the country. BOTAŞ has designed the facility for very conservative and prudent levels of seismicity, and this has been verified by the two FEA's and also by the Bank's independent seismic expert. Monitoring equipment will also be put in place, to ensure that the structures are stable. The geological risk identified at the Concept Stage therefore, has been determined to be quite manageable based on these assessments. The risk of delays or disruption due to seismic activity is considered low.
C.3 Dam safety	N	The Bank's dam safety expert has agreed an action plan with DSI and EUAS (the dam operator) for routinely monitoring the safety of the Hirfanli dam. Both DSI and EUAS, and also BOTAŞ, are committed to ensuring that the dam remains safe. Risks from dam breaks are therefore, considered negligible.

H = High; S = Substantial; M = Modest; N = Negligible or Low

6. Loan/credit conditions and covenants

There are no Board conditions. There are no Effectiveness conditions apart from the standard conditions relating to submission of satisfactory legal opinions on loan agreements.

The following covenants are proposed to be included in the loan agreement, in addition to the standard covenants relating to audits, accounts, procurement plans, mid-term reviews etc.:

Financial Covenants

(a) BOTAŞ will maintain a debt service coverage ratio of not less than 1.2 every year from 2006.

(b) BOTAŞ will achieve a self financing ratio (funds from internal resources as a proportion of the three-year average capital expenditure) of not less than 15% in 2007, and not less than 25% every year from 2008.

Regulatory Covenants

(a) BOTAŞ will submit to EMRA by January 2009 a regulatory proposal which will cover the following aspects:
- Approach for setting tariffs for the storage business including an acceptable rate of return on the regulated asset base;
- Determination of the regulated asset base for transmission and storage on a depreciated replacement cost basis which adequately compensates for domestic and international inflation.

(b) BOTAŞ shall make the Weighted Average Cost of Gas (WACOG) available to the Bank on a monthly basis, to be applicable for wholesale purchases.

Financial Management Covenants

(a) BOTAŞ will maintain a financial management system acceptable to the Bank.
(b) BOTAŞ will install and make functional the enterprise resource planning program (ERP) by December 31, 2007.

D. APPRAISAL SUMMARY

1. Economic and financial analyses

Economic Natural gas storage has four useful roles in the system that can be valued according to the benefits they yield or the costs they avoid. The economic analysis of the storage facility has identified and quantified four main roles for storage and their associated benefits (or avoided costs) as discussed briefly below. The first role for the Tuz Golu storage facility will be as a seasonal storage which allows more gas to be bought in summer, when it is readily available and generally cheaper, and withdrawn in winter, when gas may be in short supply and additional volumes will generally be very expensive. The second role is improving operational efficiency since the proposed Tuz Golu storage facility will lead to a reduction in capital and operating costs for compressor stations and loop line investments by BOTAŞ which would be needed if Tuz Golu were not built. The third role for the facility is peak shaving. Storage facilities can be used to meet demand on above-average cold days, thereby avoiding a shortfall between average contracted import quantities and peak winter day demand. This shortfall would otherwise lead to actual shortages or shifting to more expensive fuels. The fourth role of the Tuz Golu storage facility is to provide security of supply. Storage provides a contingency supply source that can be used to avoid short- or long-term gas supply shortfalls resulting from unplanned interruptions in supply, e.g., loss of import capacity.

Annex 9 evaluates the costs and benefits of the proposed gas storage facility and presents the calculated economic rate of return. The analysis is carried out for two gas demand scenarios, a high case and a low case. The analysis concludes that in either case the facility would provide a satisfactory economic return to Turkey of 17-20%.

The network expansion investments are part of the least cost expansion plan for BOTAŞ. The compressor stations are required to help transmit the increasing volumes of gas expected to be imported into Turkey from existing and new sources. The Corum station will have a capacity of 30 MW and is required in order to enable increased supply from Russia, while the Erzincan Station will have 39 MW of compression capacity and will enable the import of natural gas from Azerbaijan. The economic rate of return on these investments is shown in Annex 9. The returns are quite high since the compressor stations are needed to import additional gas and if they are not built the most likely alternative fuel is gas oil (light fuel oil) which is much more expensive. Also, the compressor stations are needed for BOTAŞ to meet its import requirements under existing contracts. If it fails to do so, take or pay penalties may be imposed under the contracts.

Financial Analysis (Annex 9 contains a detailed analysis of BOTAŞ' finances) BOTAŞ' tariffs are set by EMRA, which establishes price caps for the transmission, natural gas sales and storage businesses. BOTAŞ has traditionally kept its tariffs well below the EMRA price caps. Particularly in 2004, with costs rising with oil prices, BOTAŞ was unable to raise tariffs commensurately, both because of the desire to keep retail gas and electricity prices down and also because of the need to retain customers in the light of the onset of competition in the near future. BOTAŞ overall however, has had comfortable cash flows in the past, even though it has been constrained in increasing its tariffs to the price cap set by EMRA. BOTAŞ' cash flows have been robust largely because of the high depreciation that it has been allowed to apply (20% on most categories of assets). Depreciation rates have been reduced to a more reasonable 4.54% for a number of asset categories for investments capitalized starting 2005, which may affect cash flows in the future. BOTAŞ has in the past had problems collecting bills from government-owned consumers, primarily EUAS and municipalities. Outstanding receivables have risen to nearly 6 months' of sales, or about US$ 2.2 billion, in 2004. Of this, about US$ 1.5 billion, or nearly 70% is owed by EUAS and the three main municipalities (Ankara, Izmit and Istanbul). EUAS and municipalities are paying their current bills to BOTAŞ in time and the past receivable from these consumers is projected to remain stable throughout the projection period. The collection efficiency is expected to stay around 98% over the future. In the eventuality of EUAS or the municipalities increasing their purchases from BOTAŞ, there is a risk of further increase in the outstanding receivables. The forecasts however, show adequate cash generations even with a buildup of receivables.

The main risks that BOTAŞ faces at present and in the medium term come from the constraints on raising its prices in line with rising operating and gas purchase costs. The other factors that contribute to the uncertainties in BOTAŞ' finances relate to the evolving structure of the industry and the advent of competition. This risk has not been quantified in the forecasts, but it may pose a risk depending on the regulatory approach to transmission and storage tariffs. Current transmission charges appear low, largely due to the low asset base on which returns are calculated. For efficient operation of the transmission and storage system, it is critical that the regulatory approach is reasonable. BOTAŞ proposed the use of depreciated replacement cost as the regulated asset base, and EMRA allowed this approach in 2005. This rate base calculation needs to be improved to capture the true current cost of replacement. In addition, the regulatory treatment for storage needs to be clarified (see Annex 10). The loan agreement as a result, includes a covenant on establishing appropriate regulatory approaches towards transmission and storage.

BOTAŞ' cash flow position may not continue to be as strong in the short-term as a consequence of an increase in investments and a reduction in depreciation. Annual depreciation reduces significantly because the existing assets are almost fully depreciated and because of the revised lower depreciation rate for new assets. The cash flows improve after 2007 – the forecasts assume that BOTAŞ will break even on all costs over the next two years, and then will start generating internal resources for investments. BOTAŞ will require significant external financing for its investment program over the medium term. Forecasts show that, based on the tariff increases, BOTAŞ has the ability to borrow these amounts and service the debt comfortably (For forecast financial statements including the cash flow statement, refer to Table 9.3 in Annex 9).

The forecasts are based on a compound annual growth in gas demand of about 8% from 2004 to 2012. Particularly in 2006, gas demand is forecast to increase by 30% as new city distribution services are forecast to commence. Tariffs are anticipated to increase by about 15% in 2005, and thereafter change with the change in oil prices. Tariff increase requirements would be affected by the lowering of the depreciation rate, but the enhancement in the regulated asset base would offset the adverse impact. BOTAŞ' investment program is significant in the medium term, focusing on strengthening the existing transmission network within the country, the start of the Tuz Golu storage project and completion of distribution investments in several cities. In the future, Turkey is expecting very significant investments in cross-border pipelines such as the Nabucco and Greece pipelines, but these investments are not likely to be on BOTAŞ' balance sheet. The projections therefore, factor in relatively small expenditure on these investments.

2. Technical

The technology proposed for adoption for solution mining the caverns is a proven technology and has been successfully employed elsewhere in the world. The design and feasibility of the storage facility has been prepared by experienced and renowned engineering and technical firms, and the Bank's review has determined the work to be satisfactory.

The Tuz Golu storage site is located in one of the least seismically active regions in Turkey. The two FEA (Finite Element Analysis) studies on cavern shape and integrity confirmed that the facilities can be safely built and the risk of serious damage from earthquakes is minimal. The Bank's seismic review has also confirmed that the surface facilities are designed and constructed taking into account adequate specified peak ground acceleration values (which are relatively low for Turkey).

The water for the solution mining will be obtained from the Hirflanli Reservoir on the Kizilirmak River. It will be supplied to the site by a fresh water pipeline of about 115 km in length. The brine resulting from the solution mining will be transferred to the Tuz Golu salt lake, using gravity flow, by a brine disposal pipeline of 39 km. A gas pipeline connection will be built from the storage facility to the Kayseri-Konya-Seydisehir line, which is one of BOTAŞ' main trunk lines. This connector line will be 19 km in length.

BOTAŞ also has sufficient experience in building transmission capacity, including compressor stations. There are no serious technical issues related to this component.

Project costs are summarized in Annex 5. Cost estimates have been derived from BOTAŞ' pre-feasibility study, and have been confirmed by the feasibility study carried out by BOTAŞ' consultants. The cost estimates are considered conservative, which is appropriate for a facility of this magnitude, and accordingly, include reasonable price as well as physical contingencies.

3. Fiduciary

The Bank's standard fiduciary requirements apply to this project. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Legal Agreement. The one exception to this is the cushion gas which will be procured as described in Section 7 below (See Annex 8 for the full details of the procurement arrangements).

An assessment of the financial management arrangements for the project was undertaken in July 2005. The assessment determined that BOTAŞ has financial management arrangements acceptable to the Bank and these systems will be relied upon for project financial management purposes. However the main system will be supplemented by excel sheets for project reporting and monitoring on a foreign currency basis. There will be a special account for the project to assist disbursements from the World Bank loan. This account will be in US dollars, and will be located in a government-owned commercial bank. The commercial bank will be selected by BOTAŞ and will submit a comfort letter to the World Bank. Payments to the contractors, suppliers and consultants for the project will be made from this account (except direct payments). See Annex 7 for further details on financial management aspects.

Cushion Gas The underground storage facility will require cushion gas (currently estimated at 460 million m^3), and the cost of this cushion gas will be reimbursed from the loan (see Section D.7 on Policy Exceptions). The cost for this reimbursement will be based on WACOG and the actual measured quantity of gas injected into the caverns. The volume of gas used for cushion gas will be based on metered inflow for each billing period until the minimum gas pressure is achieved in the cavern.

BOTAŞ will finance taxes (except the withholding tax on consulting services), interest during construction, land and contingencies. The Bank loan will finance about 60% of the total project cost since the loan will cover 7 years of the 10-year project, and since BOTAŞ will finance the taxes, VAT, interest during construction, and other local expenses such as land (See Annex 5 for detailed Project Costs). This project finances less than 20% of total investments by BOTAŞ in any year, and overall, less than 15% during the project implementation period.

4. Social

The overall social impact of this project will be positive since the main component, the gas storage at Tuz Golu, will increase the availability of natural gas during the winter heating season and reduce the possibility of interruptions in supply. The project will also expand the transmission capacity of the Turkish gas transmission system thus allowing the increased imports and use of natural gas which tends to replace much more polluting fuels.

Landowners, both private and public, will be affected directly by the construction of pipelines, pump stations and storage tanks and the gas storage field, but the overall impact will be minimal.

The pipelines travel through the territory of 27 villages, but will be located away from the settlements, thus causing no resettlement. The area is sparsely populated, overall, and the pipeline route is virtually unpopulated. The population lives in small compact settlements separated by vast open spaces used for extensive grain cultivation or grazing, where agricultural production is viable, or simply not used at all, particularly southeast and south of Tuz Golu.

Landowners will experience one or more of three types of direct impact:

- Temporary easement for access during pipeline construction, after which the land is restored to its original condition;
- Permanent easement (from 10 to 38 m. wide), disrupted during construction, after which it is returned to its original condition, but carrying permanent restrictions on land use to avoid damage to the pipe;
- Land acquisition — small parcels for pump stations, storage tanks, compressor stations, and larger tracts for the storage area. Private owners will be compensated differently for easements and land purchase; the need for compensation for state and Treasury lands depends on the status of the land and its use requirements.

Land Acquisition Plan BOTAŞ prepared a Land Acquisition Plan for the project. It was reviewed and found acceptable to the Bank, and was disclosed through discussions in affected villages. BOTAŞ will implement the Land Acquisition Plan and will directly manage the process of acquiring easements and land and thereafter monitoring the work of contractors to ensure that they stay within the agreed tracts. BOTAŞ will utilize professional assessors to valuate the parcels and crops, which will be used as the basis for direct discussions with owners. Private owners are paid quickly upon reaching agreement and official transactions (transfer of title and/or registration of easement restrictions on titles) must be completed before civil works can begin. BOTAŞ gained considerable experience working under provisions of OP/BP 4.12 during the design and construction of the Baku-Tbilisi-Ceyhan Pipeline, thus the Bank team is confident that the plan will be implemented well.

The gas compressor stations at Corum and Erzincan respectively will each require a site of approximately 30 by 40 meters. This land acquisition, and others currently unforeseen, will be covered by the Resettlement/Land Acquisition Policy Framework that BOTAŞ prepared and disclosed prior to completion of appraisal.

Monitoring and Evaluation BOTAŞ will report quarterly on land acquisition progress and problems and Bank staff will conduct field visits regularly during supervision. The pipeline will have insignificant impact on individual households, so precise household-level monitoring and evaluation is not appropriate. The status of landowners in the storage area will be assessed when the site design is completed and land ownership is clarified, however, although it appears that few private owners will be affected.

5. Environment

The Tuz Golu Storage Project is designed to facilitate the use of natural gas in Turkey and will ensure availability of gas especially at times of peak demand. As discussed in Annex 9, currently, since Turkey is a winter-peaking system, the country faces peak gas shortages in the

winter in the absence of storage. At such times, gas-fired power plants switch to the use of other fuels such as fuel oil. Further, a large proportion of the peak demand arises from residential and commercial heating requirements, which again depend on sources of heating such as coal briquettes, fuel oil or wood. Thus, by providing natural gas at times of peak demand, the project will enable the reduction in the use of such fuels that are currently used in the absence of natural gas. In terms of the Bank's Operational Policy 10.04 (Economic Evaluation of Investment Operations) therefore, the project has no negative global or cross-border externalities. Since natural gas produces less greenhouse gases per unit of energy upon combustion than oil or coal, the project is expected to enable the reduction of greenhouse gas emissions. Furthermore, in terms of local and regional air quality, combustion of natural gas, particularly in winter months should lead to reductions in ambient levels of particulates and sulfur dioxide and thus contribute reduced exposure of affected populations to these pollutants.

The project is in full compliance with environmental laws and regulations of the Government of Turkey and environmental policies and procedures of the World Bank. In accordance with World Bank safeguard policy OP/BP/GP 4.01 (Environmental Assessment) the project was assigned Category A, and a detailed Environmental Impact Assessment (EIA) report was required. Prior to World Bank involvement, BOTAŞ contracted an independent consultant to prepare an EIA report to meet Turkish Environmental Assessment (EA) requirements. The EIA report was approved by the Turkish Government in 2003. The EIA report was reviewed by both the Task Team environmental specialist and the ECA Regional Safeguards Unit when the Government of Turkey requested World Bank support. Based upon this World Bank review, a number of issues were raised which the project sponsor satisfactorily addressed in an Addendum to the original EIA document. The full EIA and Addendum were sent to the Infoshop on July 8, 2005 and the Executive Summary was sent to the Executive Board on July 11, 2005. The Turkish language EIA and Supplement were disclosed in Aksaray Provincial Directorate of Environment and Forestry and the BOTAŞ Website on June 1, 2005.

Key environmental and safety issues associated with project construction include: seismic stability of the salt dome storage facilities and general project area (water supply pipeline, brine discharge area, gas distribution pipeline route), dam safety[4], environmental impacts from brine discharge into the Tuz Golu salt marsh area, and the nominal issues (dust, noise, solid waste management, etc.) associated with pipeline (water supply, and gas distribution) construction. During operation, the chief concern is public safety along the gas pipeline route.

All these issues were satisfactorily addressed in a comprehensive environmental management plan (EMP) prepared by the Borrower and which is summarized in Annex 11. The Borrower has agreed to implement this plan and has proposed to engage the services of an Independent Environmental Monitoring Company to support them in effectively meeting their responsibilities for implementing the EMP. The Independent Environmental Monitoring Company will coordinate closely with the BOTAŞ Environmental Engineer. The detailed EMP is included in the Project Files.

[4] Water for the salt dome leaching operation is to be supplied from the existing Hirfanli Dam. Since project construction will depend on the integrity of this dam World Bank policy on dam safety is triggered.

6. Safeguard policies

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP/GP 4.01)	[X]	[ ]
Natural Habitats (OP/BP 4.04)	[ ]	[X]
Pest Management (OP 4.09)	[ ]	[X]
Cultural Property (OPN 11.03, being revised as OP 4.11)	[ ]	[X]
Involuntary Resettlement (OP/BP 4.12)	[X]	[ ]
Indigenous Peoples (OD 4.20, being revised as OP 4.10)	[ ]	[X]
Forests (OP/BP 4.36)	[ ]	[X]
Safety of Dams (OP/BP 4.37)	[X]	[ ]
Projects in Disputed Areas (OP/BP/GP 7.60)	[ ]	[X]
Projects on International Waterways (OP/BP/GP 7.50)	[ ]	[X]

Dam safety

The project will use water to leach the underground caverns from the Hirfanli Dam, which is operated by EUAS. Since the project, during construction, will depend on the Hirfanli dam, the Bank's operational policy (OP 4.37) on Safety of Dams is triggered. DSI, the Government-owned agency which designs, constructs and operates dams in Turkey, carried out a site visit to Hirfanli and submitted its report on May 9, 2005. This report assessed the dam structure to be sound, although there is no monitoring equipment at the dam to take systematic measurements. The Bank's dam safety expert completed his assessment, and agreed on a framework of regular monitoring with DSI and EUAS. Both these agencies have agreed to take the necessary measures required for ensuring dam safety (Refer Annex 11 for more details). No further documentation is considered necessary.

7. Policy Exceptions and Readiness

The Bank has provided a waiver of the requirement of application of Procurement Guidelines in financing cushion gas as part of the project. Cushion gas financing will be treated on a reimbursable cost basis. For regulatory and accounting purposes, cushion gas is often treated as a capital asset. Cushion gas remains within the caverns until the facility is in operation, and may or may not be recoverable at the end. In Tuz Golu, cushion gas will be a significant cost component, currently valued at US$ 80 million. Based on these factors, the Bank has agreed to finance the cushion gas as part of the project.

The waiver from application of procurement guidelines is justified because under these guidelines, cushion gas would have had to be procured under international competitive bidding procedures, and the Bank would have required prior review of the gas supply contracts and would have had to establish the reasonableness of these contracts. BOTAŞ will procure the gas under existing long term supply contracts some of which have been contracted many years ago. It is also not feasible or economic for BOTAŞ to procure the gas outside of these existing contracts through competitive processes. Internationally, natural gas purchase and contracting is dependent on the proximity of available supply sources and the need to establish dedicated supply networks. Long term contracting is central to the construction of cross-border pipelines

or dedicated LNG supplies. While there is a limited international spot market in existence, it is used only at the margin when a shortfall is faced that cannot be met by long term supplies. Natural gas is therefore procured under long term contracts rather than through competitive bidding.

Gas markets and the prices prevailing in these markets cannot be directly benchmarked, as is the case for oil. This is because these markets, and their prices, are highly localized, with differential transport costs playing a key role in price determination. Even in the case of competitive markets such as in Europe, prices are different and do not have fixed relationships with each other.

The price at which cushion gas will be valued will be established based on the weighted average cost of gas (WACOG). WACOG is the current regulatory practice for determining the wholesale price of gas in Turkey. The volume of gas used for cushion gas will be based on metered inflow for each billing period until the minimum gas pressure is achieved in the cavern.

It is expected that the filling of each set of four caverns could take as long six months. This slow filling rate occurs due to the combined use of brine discharge facilities for both: (a) emptying the completed caverns; and (b) discharging brine from on-going solution mining of the next phase of caverns. In addition, emptying the brine from completed caverns is deemed to be a technically delicate process that, for reasons of cavern stability, should be done slowly.

Annex 1: Country and Sector or Program Background

TURKEY: GAS SECTOR DEVELOPMENT

Summary: Turkey does not have significant domestic natural gas reserves and 99% of its gas is currently imported. However, despite the lack of domestic reserves, natural gas consumption has grown rapidly in Turkey over the past two decades – with an average annual growth rate of 24%. The largest user of gas is the electricity generation industry, but considerable amounts are also used in industry, commerce and increasingly, households. Growth has naturally stabilized as the market has grown and the current decade has seen demand growth average 10% per year. With increasing urbanization, and the resulting increase in the requirement for electricity and for heating, the demand for natural gas is expected to continue to grow rapidly in the medium term.

Turkey obtains its gas supplies through imports, primarily from Russia through two pipelines, one through Bulgaria and the second one under the Black Sea. Other major gas suppliers to Turkey are Iran (by pipeline) and Algeria and Nigeria (in the form of LNG). Deliveries of gas from Azerbaijan are expected to begin in late 2006. Turkey imported about 25 billion cubic meters (bcm) of natural gas and LNG in 2004.

Turkey, due to its unique geographical location, is well-placed to be a major gas transit country, exporting into mainland Europe (this is described further below). Turkey is already in negotiations to construct large pipelines which will take Russian and other gas imports into Europe. In addition to the growing in-country demand for gas, this role for Turkey as a transit country is likely to drive the economics of the natural gas market in the medium term.

Despite its size, and despite the rapid growth in demand, Turkey currently has no natural gas storage. Most developed countries normally maintain (or have access to) storage capacity adding up to a reasonable proportion of their annual consumption (Table A.1 below). The Law requires Turkey to have storage within the country to the extent of 10% of annual consumption. The lack of storage jeopardizes the security of supply and reliability of the gas system and also the power system, which depends on gas as a major fuel source. Given that Turkey is a winter-peaking system, the lack of storage leads to gas shortages in the winter, or dependence on other fuels, or the purchase of gas at high prices. In response to the need to improve its security of gas supply, Turkey has diversified its import sources as indicated above. However, this is likely to be insufficient, and adequate storage would contribute a vital component to the security and operational efficiency of the gas system. A storage facility is under construction at Kuzey Marmara, with a capacity of 1.6 bcm. This however, has a low gas withdrawal rate and may not be adequate to meet peak demand. The Tuz Golu facility will add another 0.96 bcm of storage, and is more flexible, having withdrawal rates up to 4 times faster.

Table 1.1 Underground Gas Storage in Various Countries 2002

Country	Total Consumption (BCM)	Number of Storage Facilities	Total Storage Capacity (BCM)	Storage Capacity/ Total Consumption
U.S.A.	622	417	110	18%
Russia	338	23	90	27%
Ukraine	69	13	34	49%
Germany	98	41	19	19%
France	59	15	12	20%
Italy	57	10	12	30%
Turkey	18	0	0	0
Turkey (2015)	42	2	2.4	6%

The Turkish gas transmission system also needs to be expanded by building more transmission lines, looping existing lines and building compressor stations. This is needed in order to increase imports to meet the rapid rise in domestic demand and also to provide for the growth in gas transit.

Demand for natural gas has increased from 522 million cubic meters in 1987 to 22.1 billion cubic meters in 2004 – a 42 fold increase over the 17 years. The main source of increased demand over this period has been for gas used in electricity generation. In 2004 about 60% of all natural gas used in Turkey was used in electrical generation. Gas fired power plants have a major advantage relative to other power plants in that they are relatively less expensive to build, are cleaner, and can be constructed much more rapidly than other plants. Also since Turkey has very limited domestic energy resources (only hydropower and modest amounts of low grade lignite), there are limited alternatives. In the future, according to the forecasts prepared by the Government, most of the new generating capacity is likely to be based on natural gas.

In addition to natural gas used in power plants, there has also been rapid growth in natural gas usage in industry, fertilizer plants and households. In 2004, industry represented about 17% of demand, fertilizer plants 2% and households (including commercial usage) about 20%. In the next few years, household and commercial usage of natural gas is expected to accelerate. At present about 70% of the Turkish population lives in urban areas, and this is expected to grow to 85% over the medium term. Along with urbanization, more and more cities are being connected to the gas transmission grid. Until recently only 5 cities had gas distribution systems (Ankara, Istanbul, Izmit, Bursa and Eskisehir). Within the past year EMRA, the Energy Market Regulatory Authority, has awarded 26 licenses for gas distribution companies in hitherto unconnected cities, with another 12 cities scheduled to be awarded to private investors in the near future. This rapid increase in the number of gas distribution systems will result in an acceleration of gas usage in the residential and commercial sectors and an increased seasonal impact on gas consumption as gas used in distribution systems is used extensively to meet the

winter heating load. Gas used by the residential and commercial sector is much more seasonal than is the case with gas used in electricity generation where usage by the gas fired power plants tends to be fairly evenly spread over the course of the year[5].

Table 1.2 below shows the gas demand from 1990 through 2004 and BOTAŞ' forecast for 2010. The 2010 forecast is likely to be conservative since BOTAŞ has not factored in new gas fired power plants while the official electricity demand-supply forecasts, produced by the Turkish electricity transmission company, indicate that new capacity is needed by about 2009-10 and would be mostly fired with natural gas.

Table 1.2 Gas Demand (bcm)

Year	1990	1995	2000	2004	2010 (est)
Electricity Generation	2.6	3.8	9.7	13.0	18.0
Residential/Commercial	0.1	1.0	2.8	4.4	9.6
Other	0.7	2.0	2.1	4.7	13.3
Total	3.4	6.8	14.6	22.1	40.9

Source: BOTAŞ

Supply Currently BOTAŞ has 7 contracts to import gas from 5 countries. Most of the gas comes from Russia mainly through the Balkans but also under the Black Sea through the Blue Stream pipeline. Turkey has one LNG terminal which receives liquefied natural gas from Algeria and Nigeria. There is also a gas pipeline connection with Iran and a gas pipeline connection to Azerbaijan will be commissioned by end-2006. The major gas supply contracts, their plateau quantities and starting and ending dates are shown in Table 1.3.

Table 1.3 Gas Supply Contracts

Supplying Countries	Plateau Quantity of Gas Supplied	Operating Dates	
		Start	End
Russia (West)	6.0 bcm/year	1987	2011
Russia (West, Turusgaz)	8.0 bcm/year	1998	2020
Russia (Blue Stream)	16.0 bcm/year	2003	2025
Algeria (LNG)	4.0 bcm/year	1994	2011
Nigeria (LNG)	1.2 bcm/year	1999	2020
Iran	10.0 bcm/year	2001	2025
Azerbaijan	6.6 bcm/year	2006	2020
Total	51.8 bcm/year		

Source: BOTAŞ

In addition to the above, BOTAŞ has a contract with Turkmenistan to import up to 16 bcm per year, which however has not been implemented, and is unlikely to be implemented in the absence of a pipeline connection between the two countries. The Turkish Government is also

[5] Demand for gas for power generation is normally stable since most of the larger gas fired plants are BOTs or BOOs and operate at close to full capacity year round for contractual reasons.

considering new supply contracts with Egypt, Syria and Iraq. However, this additional gas is not needed by Turkey in the near term and will probably not be imported until it can be transited to Europe, probably through the Nabucco line (see below).

The gas supply contracts between BOTAŞ and the various gas suppliers such as Gazprom (Russia) and Sontrach (Algeria) have base prices which are indexed to crude oil and petroleum product prices. Thus the price of natural gas moves up and down, usually quarterly, with oil prices although it is normally below oil prices on a heat equivalent basis.

Transit Lines Turkey is likely to play a rapidly increasing role in the gas transit business. Because of its geographical situation between the gas markets of Europe on the one hand and the gas supplying areas of the Middle East and Caspian on the other hand, this role fits it well. This role is also likely to be quite economically attractive generating transit revenues, trading opportunities (particularly if combined with storage), economic activity (construction, jobs), increased supply security and lower transmission costs. Currently a gas transit line to Greece is under construction. Turkey is also actively involved in the Nabucco project to transit gas from the Caspian (and eventually the Middle East) to Austria and Germany.

Storage As discussed above, Turkey does not currently have natural gas storage capacity. The seasonal increase in gas demand in the winter is met by a combination of drawing down the line pack, increasing imports when available and cutting off customers such as the government-owned gas fired power plants, auto producers and others with interruptible contracts. The Government has recognized, however, that as the seasonal swing in gas demand gets stronger and gas demand continues to grow, this policy would become more difficult to implement and more questionable and that therefore gas storage is needed. A gas storage facility is under construction at Kuzey Marmara by TPAO, the state oil company, and will be leased and operated by BOTAŞ. It consists of two depleted gas field which are mostly under the Sea of Marmara and which are expected to be in operation by end-2006. This facility will provide about 1.6 bcm of working gas storage but the rate at which gas can be withdrawn is only about 11 million cubic meters per day. It is therefore not adequate to meet peak gas demand because of the low withdrawal rate.

Organization/ Gas Markets Currently BOTAŞ imports all of the natural gas used in Turkey and transmits it through its pipelines. It is also the sole wholesaler of gas in the country. Under the governing Natural Gas Market Law (Law 4646) passed in 2001, BOTAŞ is required to reduce its role in gas imports and gas wholesaling to 20% of each market by 2009. BOTAŞ is also expected to transfer its gas import contracts to private firms to reach the 20% targets. This can be either as volume release or as contract release. An ongoing contract release program aims to transfer 16 bcm worth of contracts to the private sector – this will represent about 64% of the total present supply under these contracts.

The target of 20% and the timelines for achieving the same are considered ambitious (refer the Gas Strategy Note, September 2004) and the Bank has argued that a more realistic and graduated timeframe be adopted. The Bank, in the Strategy Note, has also stated that it may not be possible to transfer existing gas contracts to private firms since the suppliers may not agree and BOTAŞ can provide very little information on these contracts to potential buyers because of the

confidentiality clauses in the supply contracts. As a result of these difficulties, the Bank has recommended a volume release program.

BOTAŞ has already transferred its distribution business into separate companies which have since been privatized. BOTAŞ is now preparing for the separation of its activities – transmission of natural gas, storage of gas, supply, and petroleum activities (Iraq crude lines, BTC) – into separate companies. The accounts of BOTAŞ have been configured into these separate businesses starting with 2004. Transmission of natural gas would remain with BOTAŞ. While there are countries which have privately owned storage, in the interim, it may be more appropriate to retain storage with the transmission company for system security and reliability purposes.

Annex 2: Major Related Projects Financed by the Bank and/or other Agencies

TURKEY: GAS SECTOR DEVELOPMENT

Overview This will be the Bank's first project in the natural gas sector in Turkey although IFC currently has some projects (see below). This is the Bank's first natural gas storage project anywhere in the world, although the Bank has done other types of gas projects in other countries such as gas production, transmission and distribution.

Energy Sector Projects The Bank has undertaken a large number of other energy sector projects in the country primarily concentrating on the electricity sub-sector. Currently three electricity sector projects are effective, with two additional projects currently under preparation. These projects are:

> **National Transmission Grid Project** This project consists of two separate loans. The first loan is to TEIAS, the Turkish national electricity transmission company, and provides financing for construction, equipment, a SCADA upgrade, and technical assistance. This loan is for US$ 250 million. The second loan is to the Government of Turkey for technical assistance in establishing an electricity market, privatization and support for the Energy Market Regulatory Authority. This loan is for US$ 20 million. Both loans are rated satisfactory.
>
> **Renewable Energy Project** This is a project to support the development of electricity generation from renewable energy sources by private companies. The loan is to Treasury which on lends the funds to the Turkiye Sinai Kalkinma Bankasi (TSKB) which is a private development bank and the Turkiye Kalkinma Bankasi (TKB).which is a Government-owned development bank. These two development banks in turn on lend the funds to private developers. The Loan is for US$ 202.03 million and is rated satisfactory.
>
> **ECSEE APL2** This is part of a US$ 1 billion regional program (ECSEE APL) to promote cooperation and integration in the electricity markets of South East Europe and *inter alia* to support the Stability Pact. The loan to Turkey (APL2) for US$ 66 Million is part of the second group of loans which also includes Serbia and Montenegro. It was signed in June 2005 and has recently become effective.

IFC has lent to two natural gas distribution companies for constructing gas distribution systems with a standby loan to the parent company in case it is interested in developing other distribution systems. These total US$ 12 million. The rapid expansion of natural gas distribution systems, such as those financed by IFC, substantially increases peak demand for gas and the need for storage to meet it.

Annex 3: Results Framework and Monitoring

TURKEY: GAS SECTOR DEVELOPMENT

Results Framework

PDO	Project Outcome Indicators	Use of Project Outcome Information
The Project objective is to increase the reliability and stability of gas supply in Turkey by implementing critically needed gas storage and network infrastructure, and support BOTAŞ in strengthening its operations as a financially stable and commercially managed corporation.	Functioning Gas Storage Facility built in three phases with an ultimate storage capacity of about 0.90-0.96 bcm. Increased carrying capacity of the Turkish gas transmission system through the completion of two compressor stations. Storage operates as separate business unit.	More reliable gas supplies for gas users and fewer interruptions in gas supplies forcing customers to shift to alternate fuels. More imported gas available in Turkey and gas transiting Turkey to Europe.
Intermediate Outcomes	**Intermediate Outcome Indicators**	**Use of Intermediate Outcome Monitoring**
Construction of phase I of storage capacity.	Storage capacity is built: Phase 1: 320 mcm (2009) Phase 2: 640 mcm (2012) Phase 3: 960 mcm (2015)	Increasing storage will reduce supply interruptions and allow BOTAŞ to capture seasonal differential in prices.
Network infrastructure under construction.	Compressor capacity of system increasing	System can carry more natural gas to domestic and foreign markets.
The storage function in BOTAŞ is established as a separate cost center with its own accounts.	Comprehensive costs available for storage on a "stand alone" basis.	Information on costs of storage and its status.

Arrangements for results monitoring

		Target Values					Data Collection and Reporting		
Project Outcome Indicators	**Baseline**	**YR1**	**YR2**	**YR3**	**YR4**	**YR5**	**Frequency and Reports**	**Data Collection Instruments**	**Responsibility for Data Collection**
Increased Natural Gas Storage Capacity (Million cubic meters)	0	0	0	0	320	320	Annual	Reports by BOTAŞ, Supervision Missions	BOTAŞ
Increased Capacity of Transmission lines to carry gas (BCM/yr)	>22	0	0	>33	>39	>40	Annual	Reports by BOTAŞ, supervision missions	BOTAŞ
Storage operates as separate business unit to ensure independence and open access	Limited cost center		Full Cost Center	➢	Full profit center	EMRA set tariffs, open access	Annual	Reports by BOTAŞ, supervision missions	BOTAŞ, auditors
Intermediate Outcome Indicators									
Storage capacity is built with completion of first phase in 2009 (% completion)	0%	10%	25%	50%	100%	100%	Quarterly	Progress Reports	BOTAŞ, owners engineeer
Compressor capacity of system increasing (MW)	164 MW	0	0	203 MW or greater	233 MW or greater	233 MW or greater	Quarterly	Progress Reports	BOTAŞ, owners engineer
Comprehensive costs available for storage on a "stand alone" basis.	Limited cost center		Full cost center				Annual	Progress Reports	BOTAŞ, Auditors

Annex 4: Detailed Project Description

TURKEY: GAS SECTOR DEVELOPMENT

The Project has two components. The first component is the underground gas storage facility located close to Tuz Golu, a salt lake in South Central Turkey. The second component is two compressor stations located close to the cities of Erzincan and Corum.

I. The Gas Storage Facility (Estimated Cost[6] US$ 365.7 million) The gas storage facility will be in an underground salt formation located close to Tuz Golu, a salt lake in South Central Turkey. The facility will have 12 caverns which will be "solution-mined" in phases of four caverns each. The facility, upon completion, will have a storage capacity of about 960 Million cubic meters of working gas and 460 million cubic meters of cushion gas[7]. The facility will have the capacity to deliver 40 Million cubic meters of gas per day for up to 20 days and can be refilled at the rate of 30 Million cubic meters per day for a period of up to about 25 days. The cushion gas however, must remain in the caverns as long as the storage facility is in operation in order for the caverns to maintain their structural integrity, given the pressure from the surrounding salt.

This component will consist of the following sub-components:

(a) The surface and sub-surface facilities (US$ 230.3 million) including engineering and construction, solution mining of 12 caverns, the gas pipelines and the compressor facility;
(b) The water and brine discharge pipelines (US$ 42.4 million);
(c) 460 million cubic meters of cushion gas (US$ 80 million); and
(d) Consulting services (US$ 13 million) including an Owner's Engineer (for assistance in supervision and monitoring of implementation), environmental monitoring, regulatory aspects, and other support to the Project Management Team.

This component is estimated to take 10 years to complete. BOTAŞ was of the view that a loan with a 10-year disbursement profile would entail high costs for BOTAŞ in the form of commitment fees. Further, BOTAŞ would in all likelihood start repaying the loan while it was still disbursing. Given these factors, it was agreed with BOTAŞ that the Bank would finance the first two phases (8 caverns) over 7 years from 2006 to 2012, and that BOTAŞ would obtain other sources of financing for the remaining investments. The Bank also agreed to consider providing additional financing for the remaining investments, in case BOTAŞ required financing from the Bank.

[6] All costs mentioned in this Annex are inclusive of VAT, taxes, duties and other local expenses.
[7] Working gas is the portion of natural gas in the caverns which can be withdrawn and injected back in, while cushion gas is the portion of gas which is required to remain in the caverns for the duration of their economic life in order to maintain cavern integrity.

II. Network Expansion (Estimated Cost US$ 88.5 million) The project will also finance two compressor stations for BOTAŞ at Erzincan and Corum and other network infrastructure as required. These stations are required to help transmit the increasing volumes of gas expected to be imported into Turkey from existing and new sources. The Corum station will have a capacity of 30 MW and is required in order to enable increased supply from Russia through the Blue Stream, while the Erzincan Station will have 39 MW of compression capacity and will enable increased imports from Iran and new imports from Azerbaijan.

Table 4.1 Forecast Project Disbursement[8] Schedule (US$ Million)

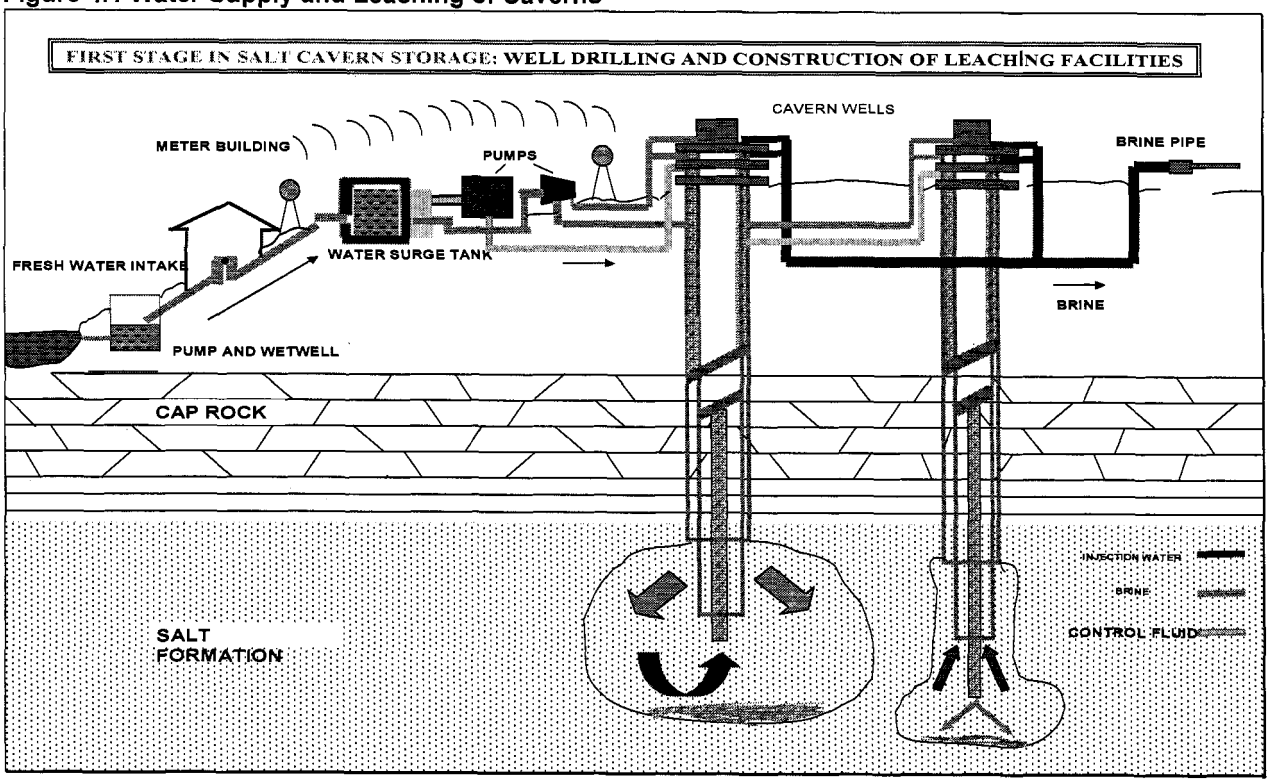
Year (Calendar)	Year	Semester	Gas Storage	Cushion Gas	Compressor Stations		Total
					Erzincan	Corum	
2006	Year 1	1	18		4		22
		2	12		8		20
2007	Year 2	3	22.5		20	3.5	46
		4	18		8	7	33
2008	Year 3	5	26.5			17.5	44
		6	20			7	27
2009	Year 4	7	15				15
		8	15	27			42
2010	Year 5	9	8				8
		10	9				9
2011	Year 6	11	6				6
		12	6				6
2012	Year 7	13	22				22
		14	25				25
Financing from the loan			**223**	**27**	**40**	**35**	**325**
2013	Year 8	15	4				4
		16	4	27			31
2014	Year 9	17	4				4
		18	4				4
2015	Year 10	19	3				3
		20	2	27			29
Total Financing			**244**	**81**	**40**	**35**	**400**

[8] These forecasts exclude VAT, taxes, duties, other local expenses and contingencies.

Construction of the Gas Storage Facility

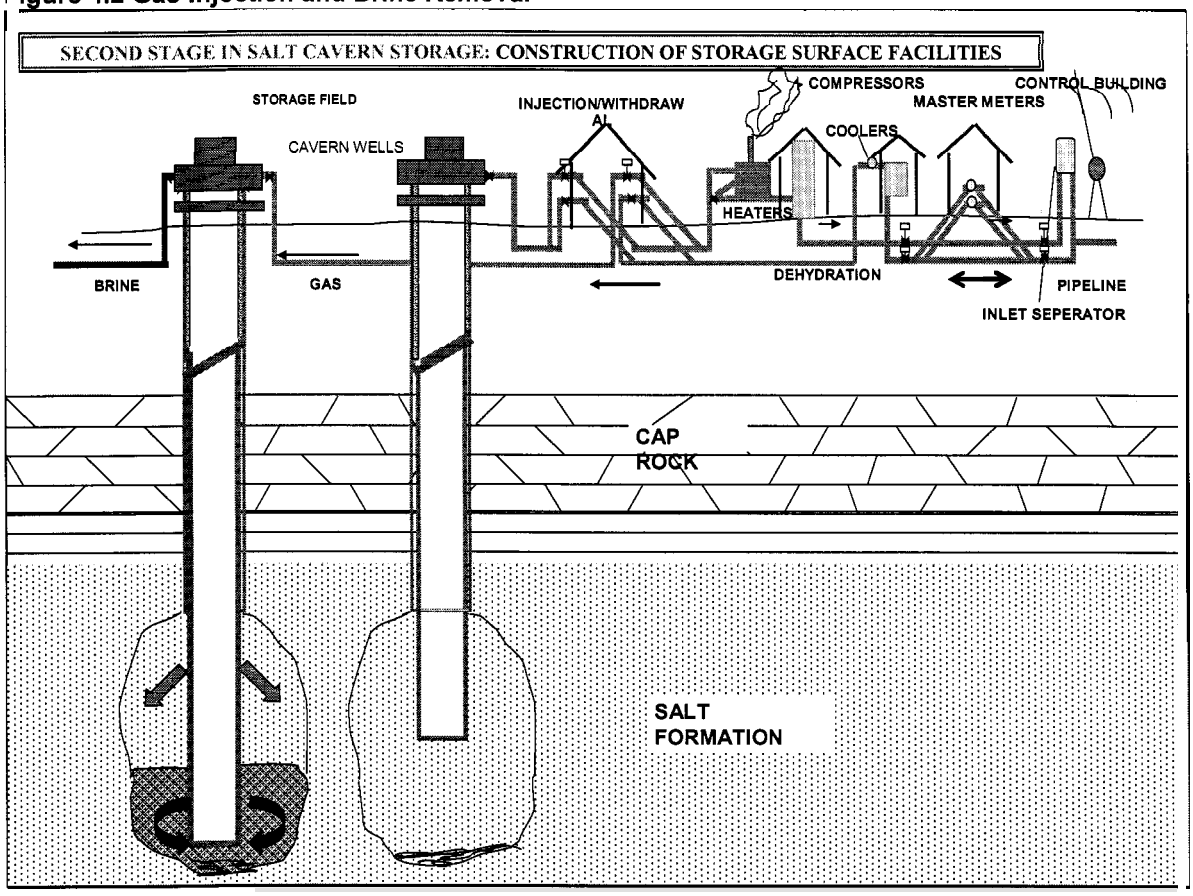
The gas storage facility will be constructed using a *solution mining* process. This consists of injecting fresh water into the salt formation and dissolving the salt in order to create a cavern. Figure 4.1, below shows this initial process of leaching the salt.

Figure 4.1 Water Supply and Leaching of Caverns



The second stage of solution mining is to replace the brine in the caverns with natural gas. Gas is injected at high pressure and the brine is forced out with the brine which is then evacuated to the Tuz Golu Salt Lake. This process of removing the brine and injecting the gas is shown in the diagram below.

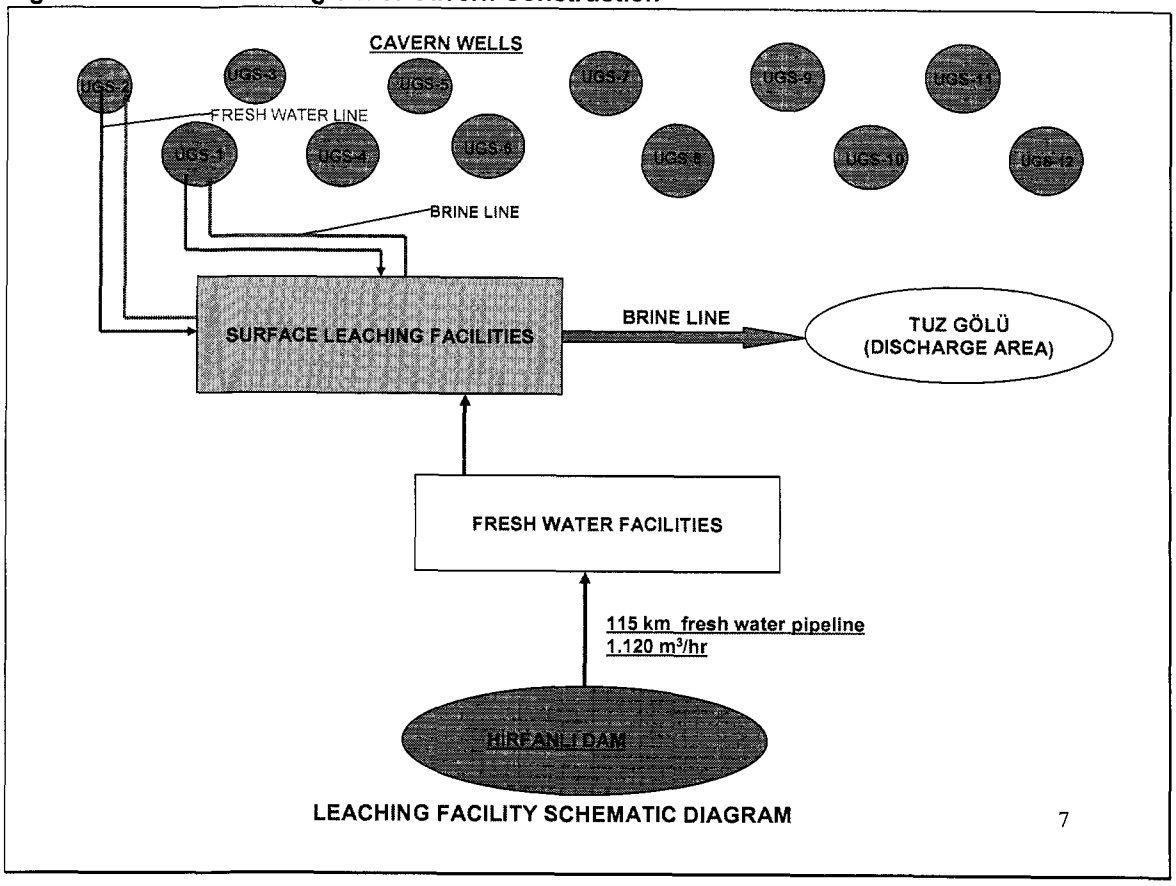
igure 4.2 Gas Injection and Brine Removal



The twelve caverns will contain about 960 million cubic meters of working gas and 460 million cubic meters of cushion gas. The storage facility will have the capacity to deliver 40 million cubic meters of gas per day of working gas for up to 20 days and can be refilled at the rate of 30 million cubic meters per day for a period of up to about 25 days. The cushion gas, however, must remain in the caverns as long as the storage facility is in operation in order for the caverns to maintain their structural integrity, given the pressure from the surrounding salt.

The water for the solution mining will be obtained from the Hirfanli Reservoir on the Kizilirmak River. It will be supplied to the site by a fresh water pipeline of about 115 km in length which will mostly follow the same right of way as an existing natural gas pipeline. The brine resulting from the solution mining will be transferred to the Tuz Golu salt lake, using gravity flow, by a brine disposal pipeline of 39 km. The salt in the brine is essentially identical to the salt which is already in Toz Golu since they come from the same formation. A schematic diagram of the water supply system, leaching process and brine disposal system is shown in Figure 4.3.

Figure 4.3 Schematic Diagram of Cavern Construction



A gas pipeline connection will be built from the storage facility to the Kayseri-Konya-Seydisehir line, which is one of BOTAŞ' main trunk lines. This connector line will be 19 km in length.

Annex 5: Project Costs

TURKEY: GAS SECTOR DEVELOPMENT

Project Cost By Component and/or Activity	Local US $million	Foreign US $million	Total US $million
1. Underground Storage	***86.3***	***278.8***	***365.1***
G1 Water and Brine Lines	**18.7**	**23.8**	**42.5**
G1-1 Pipeline Laying and Commissioning (Pumps, 28" and 24" pipes, PVC pipes, Equipment and Construction)	18.7	23.8	42.5
G2 Natural Gas Storage Facility	**66.1**	**164.0**	**230.1**
G2-1 Sub-surface Facilities (Engineering & Construction, Solution Mining Plant, 4x3 Wells Solution Mining)	43.7	92.0	135.7
G2-2 Surface Facilities (Compressor Facility, Gas Pipelines)	22.4	72.0	94.4
G3 Cushion Gas (460 million m^3 of natural gas in three stages)	**0.0**	**80.0**	**80.0**
G4 Consulting Services	**1.5**	**11.0**	**12.5**
G4-1 Owner's Engineer	0.0	8.5	8.5
G4-2 Environmental Monitoring	1.0	1.5	2.5
G4-3 Regulation of Gas Storage	0.0	0.5	0.5
G4-4 Support to Project Management Team	0.5	0.5	1.0
2. Network Expansion	***21.0***	***67.5***	***88.5***
G5-1 Corum Compressor Station [3x10 MW]	9.8	31.5	41.3
G5-2 Erzincan Compressor Station [3x13 MW]	11.2	36.0	47.2
Total Baseline Cost	**107.3**	**346.3**	**453.6**
Physical Contingencies	10.7	34.6	45.4
Price Contingencies	5.4	17.3	22.7
Total Project Costs[1]	**123.4**	**398.2**	**521.6**
Interest during construction	3.7	11.9	15.6
Front-end Fee	0.0	0.8	0.8
Total Financing Required	**127.1**	**411.0**	**538.1**

[1]The cost estimates include VAT, taxes and duties, and other local expenses. The Loan therefore, finances about 60% of the Project.

Annex 6: Implementation Arrangements

TURKEY: GAS SECTOR DEVELOPMENT

The project will be implemented by BOTAŞ, the government-owned utility responsible for developing, operating and maintaining the natural gas import, transmission and (hitherto) distribution system in Turkey. BOTAŞ was established in 1974 to construct and operate the Iraq-Turkey crude oil pipeline. Starting from a crude oil transporter, BOTAŞ has evolved and diversified over time, and is now a large profitable oil and gas conglomerate with a monopoly over gas imports and transportation. It has since increased its crude oil pipeline capacity from 35 million tons to 80 million tons, while its trade in natural gas has grown more than 40 times since 1987 to reach 21.2 billion m^3. BOTAŞ' monopoly has now been removed, per the Natural Gas Market Law 2001. It has sold its distribution activities to the private sector but kept its transmission and supply roles. Over time, BOTAŞ is expected to become a gas transmission company with the trading and marketing functions increasingly being separated and privatized.

In 2004, BOTAŞ operated about 2300 km of crude pipelines and 5,000 km of natural gas pipelines. BOTAŞ had long term gas import agreements for about 68 BCM in 2003 (some of these agreements are not currently operational and others are not operating at full capacity), and transported 21.6 million m^3 to electricity, fertilizer and other consumers.

The planning and design of the underground storage project has been carried out by the Engineering and Contracts (E&C) department of BOTAŞ. BOTAŞ used the services of a reputed engineering consortium comprising E.ON Engineering (formerly PLE), PODZEMGAZPROM (PGP) and ENVY (for seismic and environmental studies) for the feasibility, design and engineering and the technical specifications for the tender documents for the underground storage project.

The compressor stations have been designed by BOTAŞ, and procurement and implementation will be managed by BOTAŞ. BOTAŞ has significant experience in constructing and operating compressors, and will be able to manage this process without external assistance.

Cushion gas will be procured through ongoing long-term natural gas and LNG supply contracts from Russia, Iran, Nigeria, Algeria and Azerbaijan in three installments. The valuation of this gas will be done based on the weighted average cost of gas at the time of injection of the gas into the caverns. A reimbursement procedure has been prepared, which includes the process of measurement and verification of the volume and value of gas injected into the caverns.

The E&C department has a separate Underground Storage Unit staffed with geologists and engineers who will have primary responsibility over the procurement and implementation of the gas storage facility. The E&C department will have oversight over the entire project, and a Project Management team has been set up for this project under the coordination of this department.

The loan will finance supervision consultants, the Owner's Engineer, to assist BOTAŞ in managing the implementation of the underground storage project. The main aspect where the

consultant is expected to play a role, apart from routine monitoring and supervision, will be the integration of the Sub-surface and Surface Facility packages, which are being contracted separately.

The project is expected to be completed in 10 years. The caverns will be commissioned in 3 batches of 4 caverns each, the first batch being completed in 4 years, with the subsequent batches taking about 3 years each. The compressor stations will require 18 months to commission, and will begin respectively in June and December 2006. The entire project is expected to be completed by 2015. A procurement and implementation plan has been prepared (See Annex 8) and is considered reasonable.

Annex 7: Financial Management and Disbursement Arrangements

TURKEY: GAS SECTOR DEVELOPMENT

An assessment of the financial management arrangements for the project was undertaken in July 2005 and updated in October 2005. BOTAŞ has financial management arrangements acceptable to the Bank and these systems will be relied upon for project financial management purposes. However the main system will be supplemented by excel sheets for project reporting and monitoring on foreign currency basis.

A summary of the conclusions for the project financial management purposes are as follows:

	RATING	COMMENTS
1. Implementing Entity	Satisfactory	BOTAŞ will be implementing the project.
2. Funds flow	Satisfactory	The Bank loan will finance about 60% of the total project costs.
3. Staffing	Satisfactory	Qualifications and experience of BOTAŞ staff are satisfactory.
4.Accounting Policies and procedures	Marginally Satisfactory	Accounting policies and procedures for the project should be documented.
5. Internal Audit	NA	No reliance on internal audit
6. External Audit	Satisfactory	BOTAŞ has been engaging the services auditors for the last 3 years.
7. Reporting and Monitoring	Satisfactory.	The formats and contents of the FMRs determined and agreed with the Bank.
8. Information systems	Satisfactory	BOTAŞ will be using integrated excel worksheets for the project accounting and reporting in foreign currency.
OVERALL FM RATING	Satisfactory	

Country Issues

Until 2001–02, public financial management in Turkey was dominated by an outdated legal framework. Enactment of the PFMC Law in 2003 was a defining moment for public financial management in Turkey. The Public Financial Management and Control (PFMC) Law (No. 5018) was enacted by the Parliament in December 2003. The law set up the framework for the modernization of public financial management in Turkey and significantly improved the financial management environment in the Country.

State Economic Enterprises (SEEs) in Turkey are subject to basic accounting and auditing obligations which apply to companies in Turkey. These are laid down in the *Commercial Code*, which was last revised in 1956. More detailed requirements were introduced in the *Tax Procedures Law* of 1950 (which has since been consolidated into the *Tax Procedures Code*). Under the powers granted to it by the Code, the Ministry of Finance (MOF) introduced a Uniform Chart of Accounts which became effective on January 1, 1994. The purpose of these

requirements is to provide information to the taxation authorities, there is no obligation to publish the financial statements, nor are they subject to a mandatory financial statement audit. Large companies are required to have their financial/tax statements certified by a *Sworn Certified Public Accountant* (see below), but this process of certification is concerned with tax compliance issues, and is not a financial statement audit. SEEs however are not subject to the obligatory audit of the Sworn Certified Public Accountants. Audits of the SEEs are conducted by the Higher Audit Board under the Prime Minister's Department.

The energy sector in Turkey is regulated by EMRA. The regulation published by EMRA in the official Gazette dated October 3, 2003 sets the standards for audits in the energy sector companies. It also refers to the regulations of EMRA on accounting and reporting in these companies. However these regulations are still under preparation by EMRA.

Risk Analysis

A summary of the risk assessment for the project is as follows:

	Risk	**Comments**
INHERENT RISK		
1. Country Financial Management Risk	High	Based on CFAA report
2. Project Financial Management Issues	Moderate	
Overall Inherent Risk	Moderate	
CONTROL RISK		
1. Implementing Entity	Negligible	
2. Funds Flow	Negligible	
3. Staffing	Negligible	
4. Accounting Policies and Procedures	Negligible	
5. Internal Audit	N/A	
6. External Audit	Negligible	
7. Reporting and Monitoring	Negligible	
8. Information Systems	Moderate	Integrated excel sheets will be generated for the project
Overall Control Risk	Negligible	

RISK MITIGATION STRATEGY

Country financial management risk – the project will be implementation will be centralized at BOTAŞ.

Control Risk – BOTAŞ will have the ERP implemented so that full integration of the project financial management into BOTAŞ systems is possible, by December 2007.

Implementing Entity

The project will be implemented by BOTAŞ. BOTAŞ previously an equity participation of Turkish Petroleum A.S. became an SOE in 1995 with articles of association published on the official gazette 22261. BOTAŞ is responsible for building pipelines for petroleum and natural gas both in and outside Turkey, taking over, buying or renting already constructed pipelines, transferring petroleum, petroleum products and natural gas with the pipelines and purchasing and selling the petroleum and natural gas transferred by these pipelines and also doing business analysis overseas for the purchase of petroleum and natural gas. BOTAŞ headquarters is in Ankara and there are five regional establishments (including the Baku Ceyhan Tibilisi (BTC) pipeline operations). A Project Management Team within BOTAŞ has been established for the project. The project activities will be coordinated by one of the Assistant General Managers and related departments within the institution will be responsible for the bidding, construction supervision, approval, payment and reporting functions. The financial management functions under the project will be carried out by the Finance and Accounting Department (FAD).

The risk associated with the implementing entity is assessed as negligible.

Funds Flow

There will be a special account (SA) for the project opened and maintained by BOTAŞ. The account will be denominated in US Dollars and will be opened in a government owned commercial bank under terms and conditions acceptable to the Bank. The commercial bank will be selected by BOTAŞ and will submit a comfort letter to the World Bank.

The risk associated with funds flow is considered as negligible.

Staffing

The financial management arrangements for the project will be the responsibility of the FAD of BOTAŞ. The staffs working at the department are adequately qualified and experienced.

The risk associated with staffing is considered as negligible.

Accounting Policies and Procedures

The project accounting will be maintained by the FAD. The main transactions, that are the movements of the special account, loan account and project expenditures will be in the main accounting system of the company and could be accessed any time on YTL basis. The current accounting system is developed by the IT department of BOTAŞ and there is an online connection between the general directorate and the regional offices. However the system is old and it is not technically possible to generate the reports form the current system. The auditors also had observations relating to the inadequacies of the current system in their management letter and they have recommended replacing the current IT infrastructure with one that will address the requirements of the organization. BOTAŞ aware of these inadequacies is in the process of tendering of the new Enterprise Reporting Program (ERP). Once the ERP project

becomes functional all technical and software infrastructure of BOTAŞ will be updated. However since ERP is not expected to become functional when the project becomes effective, BOTAŞ will use integrated excel worksheets to monitor the project on foreign currency basis. These excel worksheets will also be used for generating project reports. These sheets will be reconciled regularly to the main accounting records.

Accounting procedures for the project will be set out in the project financial management manual. The manual will cover (a) the financial and accounting policies and procedures for the project (b) organization of the financial management (c) the financial management information system (d) disbursements (e) budgeting and financial forecasting (f) project reporting and (g) project planning procedures.

The risk associated with accounting policies and procedures is considered as negligible.

Internal Audit

BOTAŞ has an investigation department which investigates irregularities noted in the institution. There is not a separate Internal Audit department and therefore no reliance will be placed on internal audit.

Reporting and Monitoring

BOTAŞ will maintain records and will ensure appropriate accounting for the funds provided. Financial statements for the project will be prepared by BOTAŞ. The Financial Monitoring Reports (FMR) will be prepared quarterly and will be submitted to the Bank no later than 45 days after the end of the semi-annual period. The formats of the FMRs have been agreed with BOTAŞ.

The financial management manual of the project will include a section on the FMRs and formats of these reports will be included in the manual.

The risk associated with reporting and monitoring is assessed as negligible.

Information Systems

BOTAŞ will use integrated excel sheet that comply with the main accounting records for project accounting and reporting in foreign currency. It is not technically possible to integrate detailed project accounting and reporting into the Company's main accounting system.

The risk associated with information systems is assessed as moderate. BOTAŞ will implement the ERP which will facilitate full integration of project financial management to the company's systems by December 2007.

Strengths and Weaknesses

The significant strength that provides the basis of reliance on the project financial management system is that BOTAŞ has experience in the implementation of projects financed by international organizations.

The particular weakness in the project is that the current accounting system of BOTAŞ is old and therefore integration of the project financial management fully to the BOTAŞ system is not possible and integrated excel worksheets will be relied upon until ERP an Enterprise Reporting Program becomes functional. BOTAŞ is committed to have the ERP functional in December 2007 and this will be monitored closely by the Bank by providing the necessary technical resources.

Action Plan

It is concluded that the financial management environment of BOTAŞ is satisfactory but additional actions should be taken to address the project financial management issues. Following action plan is proposed to address the issues relating to the project until ERP is functional and project financial management is fully integrated into BOTAŞ systems:

Action	Deadline
1. BOTAŞ prepares project financial management manual	October 30, 2005
2. BOTAŞ engages the auditor for the audit of its financial statements for the years ended December 31, 2004 and 2005.	December 15, 2005

BOTAŞ has also agreed to the following:

1. BOTAŞ will maintain a financial management system acceptable to the Bank.
2. BOTAŞ financial statements will include sufficient disclosures relating to the project and will be audited by independent auditors acceptable to the Bank and on terms of reference acceptable to the Bank. The acceptable accounting and auditing standards for the Bank are IFRS and ISA. The annual audited statements and audit report of BOTAŞ and the Project will be provided to the Bank within six months of the end of each fiscal year.
3. BOTAŞ will install and make functional the enterprise resource planning program (ERP) by December 31, 2007.

Supervision Plan

During project implementation, the Bank will supervise the project's financial management arrangements as follows; (i) project's quarterly financial management reports as well as the project's annual audited financial statements and auditor's management letter will be reviewed; (ii) during the Bank's supervision missions financial management and disbursement arrangements will be reviewed to ensure compliance with the Bank's minimum requirements,

and (iii) reliance on the company systems for project accounting and reporting will be undertaken once the ERP becomes functional. As required, a Bank-accredited Financial Management Specialist will assist in the supervision process.

External Audit

BOTAŞ financial statements as well as the project financial statements will be audited by independent auditors acceptable to the Bank. BOTAŞ financial statements for the years ended December 31, 2001, 2002 and 2003 were audited in accordance with IFRS and ISA by Deloitte. BOTAŞ is currently tendering the audit of its financial statements for the years ended December 31, 2004 and 2005. They expect to assign auditors by December 15, 2005.

The auditors have issued a qualified audit opinion on the financial statements of BOTAŞ for the years ended December 31, 2001, 2002 and 2003. The qualifications were as follows:

- The financial statements of BOTAŞ for the year ended December 31, 2000 have not been audited. The auditors qualified the fact that any errors brought forward from previous years would affect the results for the years ended 31 December 2001, 2002 and 2003.

- The auditors were unable to attend the physical inspections of the assets performed by the Company as at December 31, 2003, 2002 and 2001.

- Two equity participations 100% owned by the company were privatized in year 2004. Since IFRS audited financial statements were not available, these companies were not consolidated in accordance with IAS 27 and 28 in the audited financial statements. In addition no inflation adjustment in accordance with IAS 29 were made in the financial statements as at December 31, 2002 for the loss amounting to TL 13,575,119 million generated and recorded as a result of these privatizations.

- The company sells natural gas to EUAS and has receivables subject to conflicts and legal follow up from EUAS relating to these sales.

- BOTAŞ's 35% shareholding in one of its subsidiaries is shown from indexed cost rather than the equity method as required by IFRS since IFRS financial statements were not available for the company.

- The Company's fixed assets should be reviewed for impairment. The indexed net book values of the property, plant and equipment in the audited financial statements have been calculated based on the available initial acquisition costs and acquisition dates. Appraisal values of the properties could be substantially different than their indexed net book values.

- The deferred tax calculation base differed for the years 2003, 2002 and 2001, due to the impacts of the local legislation relating to inflation accounting.

- The auditors were unable to obtain confirmation letters for the bank loans in the financial statements.

The main observations of the auditors in the management letter related to the inadequacies of the current accounting system and they have recommended replacing the current IT infrastructure with one that will address the requirements of the organization.

The Higher Audit Board (YDK) report for the year ended December 31, 2003 has been reviewed. There were no major recommendations relating to the internal control procedures of BOTAS.

The risk associated with external audit is assessed as negligible. BOTAŞ has been engaging the services of auditors and it is required that they will assign the auditor for the years ended December 31, 2004 and 2005 no later than December 15, 2005.

Disbursement Arrangements

The authorized allocation will be established at US$40,000,000 except that for the initial period of project implementation, the allocation will be limited to US$20,000,000 until total disbursement under the loan exceeds US$120,000,000. Loan proceeds will flow from the World Bank to the SA but direct payment requests and special commitments will also be available in accordance with standard Bank guidelines for disbursement. The Project will use traditional disbursement methods in accordance with BOTAŞ's preference.

Use of statements of expenditure (SOEs): The Statement of Expenditures (SOE) procedure will be used for expenditures incurred in respect of all contracts which do not require the Bank's prior review, i.e., for expenditures for: (i) contracts for goods costing less than US$1,500,000 equivalent each, (ii) for services of individual consultants costing less than US$100,000 equivalent per contract, (iii) for services of consulting firms under contracts costing less than US$500,000 equivalent per contract, and (iv) for cushion gas (except the first three payments which will be subjected to Bank review), all under terms and conditions specified by the Bank. For all other contracts, disbursement will be made on the basis of the Summary Sheet with full documentation. BOTAŞ will maintain all original source documentation supporting SOEs and Summary Sheets and make them available for review by auditors and the Bank staff until one year from the receipt of the final Project audit report.

Construction completion reports will first be checked at the construction sites. The reports will then be evaluated by the related group within Construction Department at the General Directorate. It will then be sent to the FAD with the approval of the Department and Assistant General Manager. The FAD department will process and make the payment from the special account. BOTAŞ has authorized signatories in the FAD and the payments from the special account will be made with the signatures of two of these authorized signatories.

BOTAŞ has submitted its investment proposal to SPO in September 2005. BOTAŞ budget allocation proposals for the project are YTL 36 Billion (approximately US$27 million), YTL 58 Billion (approximately US$43.9 million) and YTL 67 Billion (approximately US$ 50.8 million)

for the years 2006, 2007 and 2008 respectively. Approval of the budget will be finalized in December 2005.

Cushion Gas financing: Procedures to finance expenditure for the cushion gas component will be as follows: Cushion gas will be financed from the Loan at the Weighted Average Cost of Gas (WACOG) on a monthly basis and based on the actual measured quantity of gas injected into the caverns.

Utilization of Loan Proceeds: BOTAŞ will finance taxes (excluding withholding taxes for consulting services which will be financed out of the loan), interest during construction, land and contingencies. The Bank loan will finance about 60% of the total project cost since the loan will cover 7 years of the 10-year project, and since BOTAŞ will finance the taxes, VAT, interest during construction, and other local expenses such as land. This project finances less than 20% of total investments by BOTAŞ in any year, and overall, less than 15% during the project implementation period.

Category	Loan Allocation (US$ million)	% of Expenditure to be financed
1. Goods (including supply and installation)	286.1875	100 % of foreign expenditures, 100%of local expenditures (ex-factory cost) and 85% of other items procured locally
2. Consultants' services	9.0	100%
3. Cushion Gas	27.0	100%
4. Front-end Fee	0.8125	Amount due under Section 2.04 of the Loan Agreement
5. Premia for Interest Rate Caps and Interest Rate Collars	0.0	Amount due under Section 2.09 (c) of the Loan Agreement
6. Unallocated	2.0	
Total	325.0	

Withdrawals, in an aggregate amount not exceeding US$5,000,000 may be made in respect of Categories (1) and (2) set forth in the table above on account of payments made for expenditures before the date of the Loan Agreement, but after September 30, 2005.

Annex 8: Procurement Arrangements
TURKEY: GAS SECTOR DEVELOPMENT

A. General

Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement Under IBRD Loans and IDA Credits" dated May 2004; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated May 2004, and the provisions stipulated in the Legal Agreement. The general descriptions of various items under different expenditure categories are described below. For each contract to be financed by the Loan, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Borrower and the Bank project team and listed in the Procurement Plan. The Procurement Plan will be updated regularly to reflect the actual project implementation needs and improvements in institutional capacity.

Procurement of Works: No Works contracts are foreseen in the Project.

Procurement of Goods/Supply and Installation: Goods procured under this project would include: Supply and Installation of Water and Brine Lines; Supply and Installation of Gas Storage Plant including Surface and Sub-Surface facilities; Supply and Installation of Compressor Stations; Supply of steel and PVC pipes. Because of the size and complexity of the Gas Storage Plant, prequalification of bidders will be done in accordance with the provisions of paragraphs 2.9 and 2.10 of the Procurement Guidelines. The procurement of readily available off-the-shelf goods having a small value may also be necessary during the implementation of the project.

The envisaged methods for the procurement of Goods/Supply Installation contracts in this Project are;

-International Competitive Bidding (ICB); and
-Shopping (S) for goods estimated to cost less than US$100,000.

The procurements will be conducted using the Bank's latest Standard Bidding Documents for all International Competitive bidding.

Goods/Supply and Installation Contracts estimated to cost above US$1,500,000 per contract, and the first contracts for each bidding method, regardless of the estimated cost, will be subject to prior review by the Bank.

Procurement of non-consulting services: No non-consulting services are foreseen in the Project.

Selection of Consultants: Consulting firms would be required for supervision, environmental monitoring, and regulation of gas storage. Short lists of consultants for services estimated to cost

less than $200,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Individual consultants may also be required for highly specialized subjects and for support to the Project Management Team.

The envisaged procurement methods for the Selection of Consultants in this project are:

- Quality and Cost Based Selection (QCBS);
- Selection Based on the Consultants Qualifications (CQS) for the services estimated to cost less than $200,000;
- Individual Consultants.

Consultancy services estimated to cost above US$500,000 per contract and Individual Consultants estimated to cost above US$100,000 per contract will be subject to prior review by the Bank. Regardless of the estimated cost, the first contracts for each selection method and the Terms of References of all individual contracts will be subject to prior review by the Bank.

Operational Costs: The project will not finance any operational cost.

Cushion Gas: The cost of Cushion Gas with an approximate amount of about 200 million meter cubic will be reimbursed from the Loan at the Weighted Average Cost of Gas (WACOG) based on the actual measured quantity of gas injected into the caverns. The Bank's Management provided a waiver from the application of the Bank's procurement Guidelines as gas purchasing does not lend itself to competitive procurement owing to the nature of the gas market internationally and in Turkey (see Section D.7 of the main text in this regard).

B. Assessment of the agency's capacity to implement procurement

Procurement activities will be carried out by BOTAŞ.

Assessments of the capacity of the Implementing Agency to implement procurement actions for the project have been carried out by the Bank team on February 01, 2005, April 06, 2005, April 25-28, 2005 and July 14, 2005. The assessments reviewed the organizational structure and procedures for implementing the project.

BOTAŞ has established a Project Management Team under the coordination of Engineering and Contracts Department. The Project Management team consists of the Department Head, Underground Storage Manager, one Petroleum Engineer, one Mechanical Engineer, one Architect and one Environmental Engineer. The team will be supported by the procurement staff experienced in public procurement and other international procurement procedures during the procurement process.

BOTAŞ as an institution has experience in the procurement and implementation of large international contracts such as the Blue Stream gas pipeline (from Russia to Turkey under the Black Sea) and the BTC oil pipeline. However, BOTAŞ does not have experience under the

Bank's procurement Guidelines (except the selection of consultants under Gas Storage Trust Fund).

Considering that the BOTAŞ staff has little experience in the Bank's procurement procedures the following action plan for reducing procurement risk was agreed:

1. During the project preparation stage in early April 2005, the Project Management team staff was informed about the Bank's procurement Guidelines, Standard Bidding documents and the procedures.
2. The Project Management Team Staff participated in the procurement training given on June 24, 2005 by the Bank's procurement specialist in the Bank's Ankara office.
3. Since BOTAŞ intends to initiate the procurements before the Loan negotiations, in the preparation of the bidding documents BOTAŞ' staff and the Bank's procurement specialist agreed to work closely.
4. BOTAŞ agreed to send two staff to a procurement seminar on the Bank's procurement procedures before the Loan Negotiations.
5. BOTAŞ staff will participate in regular monthly procurement meetings arranged by the Bank's procurement specialist.

The overall project risk for procurement is high.

C. Procurement Plan

The Borrower, at appraisal, developed a Procurement Plan for project implementation which provides the basis for the procurement methods. This plan has been agreed between the Borrower and the Project Team on October 6, 2005 and is available at the Project Management Team's office in BOTAŞ. It will also be available in the Project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team to reflect the actual project implementation needs and improvements in institutional capacity.

D. Frequency of Procurement Supervision

In addition to the prior review supervision to be carried out from Bank offices, the capacity assessment of the Implementing Agency has recommended semi-annual supervision missions to visit the field to carry out post review of procurement actions.

The Project Management Team in BOTAŞ will keep a complete and up-to-date record of all procurement documentation and relevant correspondence in its files which will be reviewed by the Bank staff during supervision missions.

Monitoring reports on procurement progress in the form of completed-ongoing-planned procurements will be submitted semi-annually as an integral part of the Financial Management report on Project implementation.

E. Other

BOTAŞ may initiate the procurements scheduled in 2005 (or before the Loan effectiveness date) in accordance with the Bank's Procurement Guidelines [(Refer to paragraph 1.9 of the Procurement Guidelines and paragraph 1.12 of the Consultant Guidelines]. The contracts which will have been reviewed by the Bank may retroactively be financed by the Bank as described in the Loan Agreement.

Attachment 1

Details of the Procurement Arrangements

1	2	3	4	5	6	7	8	9 (Estimated Time Schedule) #c			
Contract Reference No	Description	Type	Number of items/ sub-packages	Procurement Method	Prequalification (Yes/No)	Review Method (Prior/Post) #b	Domestic Preference (Yes/No)	Expected (PQ/BD/RFP) SPN/ Invitation Issue Date	Expected Bid Opening/ Proposal Submission Date	Expected Contract Signing Date	Expected Contract Completion Date
	A. GOODS / SUPPLY AND INSTALLATION CONTRACTS										
G-1	*Water and Brine Lines*										
G-1-1	Pipeline Laying and Commisioning (Pumps, 28" and 24"Pipes, PVC pipe, Equipment and Construction)	G/SI	1	ICB	No	Prior	No	Oct-05	Dec-05	Mar-06	Aug-07
	Sub-Total G-1										
G-2	*Gas Storage Plant*										
G-2-1	Sub-Surface Facilities (Engineering and construction of solution mining)	G/SI	1	ICB	Yes	Prior	No	PQ-[Dec 2005-Sept 2006] BD-Sept 2006	Dec-06	Mar-07	Dec-15
G-2-2	Surface Facilities (Compressor Facility and Gas pipelines)	G/SI	1	ICB	Yes	Prior	No	PQ-[Dec 2005-Sept 2006] BD-Dec 2006	Mar-07	Jun-07	Jun-10
	Sub-Total G-2										
G-3	*Compressor Stations*										
G-3-1	Corum Compressor station (3x10 MW)	G/SI	1	ICB	No	Prior	No	Jan-06	Mar-06	Jun-06	Dec-07
G-3-2	Erzincan Compressor station (3x13 MW)	G/SI	1	ICB	No	Prior	No	Jan-06	Mar-06	Dec-06	Jun-08
	Sub-Total G-3										
	Total Goods/Supply and Install										
	B. CONSULTANTS' SERVICES										
CS-1-1	Consulting Services for Supervision of S/I Works (Owner's Engineer)	CS	1	QCBS	N.A.	Prior	NA	Nov-05	Dec-05	Mar-06	Dec-15
CS-1-2	Consulting Services for Environmental Monitoring	CS	1	QCBS	N.A.	Prior	NA	Nov-05	Dec-05	Mar-06	Dec-15
CS-1-3	Regulation of Gas Storage	CS	1	QCBS	N.A.	Post	NA	Jan-06	Apr-06	Jun-06	Dec-07
CS-1-4	Support to Project Management Team	CS	Multiple	IND/CQS	N.A.	Post	NA	Oct-05	Dec-05	Jan-06	Dec-15
	Total Consultants' Services										
	TOTAL										

(#a): The Total Costs are inclusive of all taxes (excluding VAT) and duties. The Contract costs will be financed by the Bank including year 2012. The total amount of Bank financing will not exceed US$325 Million.

(#b): All ICB contracts equivalent or above US$ 1,500,000 and all QCBS contracts equivalent or above US$ 500,000 are subject to Bank's prior review. Regardless of type of review method written in this column the first contract for each of ICB, S, QCBS and CQS contracts are subject to Bank's prior review. Individual Consultants' contracts equivalent or above US$ 100,000 are subject to Bank's prior review.

(#c): The dates are provided only for the Procurements within the first 18 months of the Project.

QCBS: Quality and Cost Based Selection
CQS: Selection Based on Consultants Qualification
SSS:Single Source Selection
IND:Individual Consultant
PQ: Prequalification; BD: Bidding Document; RFP: Request for Proposal; SPN: Special Procurement Notice

G: Goods
SI:Supply and Installation of Plant and Equipment
TS:Service (other than consultant services)
NA: Not Applicible

Annex 9: Economic and Financial Analysis

TURKEY: GAS SECTOR DEVELOPMENT

Economic Analysis of Storage Component

A. Introduction

Although Turkey's gas transmission system and supply have grown rapidly in recent years, the country does not have a long-term or strategic storage facility[9]. This jeopardizes the security of supply and reliability of the gas system, the power system which depends on gas as a major fuel source, and the wider downstream economy.

In response to the need to improve its security of gas supply, Turkey has diversified its import sources. However, this is insufficient and a seasonal storage would contribute a vital component to the security and operational efficiency of the gas system. As demand from residential distribution customers is likely to be the fastest growing sector, and residential customers have very 'peaky' demand, the future peak winter day gas requirement is likely to increase. This will create a further need for Turkey to have sufficient gas storage capability in its gas system.

This annex evaluates the economic and financial aspects of a proposed gas storage facility at Tuz Golu in central Turkey, and presents the calculated economic rate of return. It does so under two different gas demand scenarios, a high-demand case and a low-demand case. It finds that in either case the facility would provide a satisfactory economic return to Turkey.

B. Benefits of Storage

Storage has four useful roles in the system that can be valued according to the benefits they yield or the costs they avoid: These four main benefits are given briefly below. Further below there is a more detailed analysis of how these benefits are estimated for the Tuz Golu project.

1. **Seasonal storage**: Storage allows more gas to be bought in summer, when it is readily available and generally cheaper, injected into storage and withdrawn in winter, when gas may be in short supply and additional volumes will generally be very expensive. Although there is no seasonal gas market with differential summer and winter prices in Turkey today, a price difference is expected to emerge in the future.

2. **Operational efficiency**: The proposed Tuz Golu storage facility will lead to a reduction in compressor costs and loopline investment. These would be needed if Tuz Golu were not built, to support gas supply and pressure in the south western part of the transmission system. The saved costs are benefits to the storage project.

3. **Peak shaving**: Storage can be used to meet demand on above average cold days, thereby avoiding a shortfall between average contracted import quantities and peak winter day

[9] There is a minor amount of storage in the form of the line pack in the transmission lines and whatever LNG may be in the tanks at the LNG terminal.

demand. Depending on weather patterns, the typical (normal) winter might have 30 days when peak demand would need to be met from storage, otherwise some customers' supply (e.g. EUAS power plants) would be interrupted. The benefit of using storage is the savings in avoided cost of interruption, which can be valued at the higher price of alternate (oil) fuels.

4. **Security of supply and reliability**: Storage provides a contingency supply source that can be used to avoid short- or long-term gas supply shortfalls resulting from unplanned interruptions in supply, e.g. loss of import capacity. This benefit can be valued at the cost of an interruption (e.g. the higher price of substitute fuels, and other costs) and the probabilistic analysis of the loss of each main import supply.

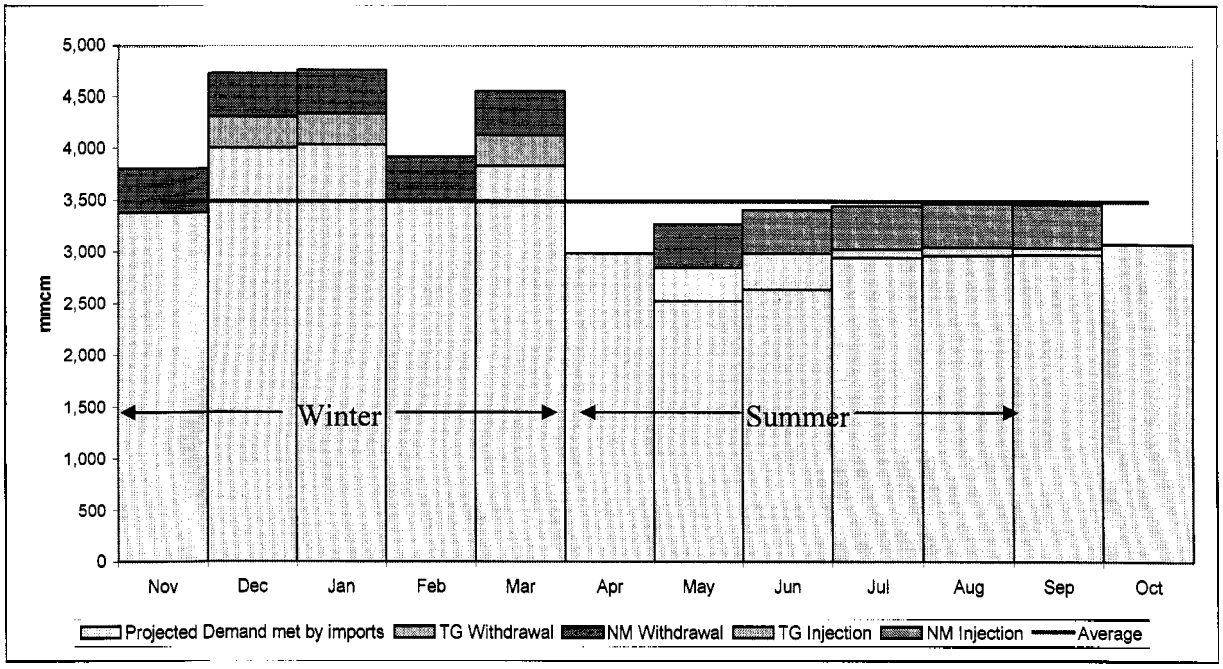
C. Seasonal Storage

Seasonal storage would allow BOTAS to better match its customers' seasonal demand swing with its relatively flat annual import profile. 'Flat' contracts, i.e. contracts with limited flexibility in the nomination of variations in delivered volumes, are generally cheaper than contracts with a large amount of flexibility (large 'swing'). In addition, gas is more readily available in summer whereas additional volumes to meet extra demand in winter may not be available.

The peak winter requirement, and corresponding lower demand in summer, is mainly caused by small and residential customers, although there is some seasonality in power sector demand. To achieve a completely flat import profile, with the current seasonal demand profile and annual imports at about 25 bcm/year, could require up to 5 bcm (say 20% of demand) of working storage capacity (depending on how the winter-summer pattern evolves). This is significantly more than the capacity of the North Marmara and Tuz Golu facilities. However, these two storage facilities will contribute significantly to flattening Turkey's seasonal swing.

An example of how the North Marmara and Tuz Golu storage facilities may be used to help monthly balancing of seasonal demand is shown in Figure 9.1. Total demand is a projection for 2015.

Figure 9.1 Example of seasonal balancing from storage



Source: BOTAS technical data, ECA storage simulations

Valuation of Seasonal Storage: Seasonal storage is proposed to be valued at the difference between the value of summer and winter gas, often referred to as the value of 'swing'. Although there are no seasonal prices in Turkey today, the various contracts have different price formulae which can produce a different price in summer and winter as the mix changes.

- Firstly, having satisfied the minimum summer contract requirements on higher priced contracts, Turkey can then buy storage gas from the lowest priced contract (up to the maximum take) for release in the winter.

- Secondly, having met its minimum summer contract quantities, Turkey can seek new contracts for additional 'flat' gas at prices below its existing contracts. It appears that lower prices have been offered to Turkey in summer (but with the lack of storage they could not have taken it).

Turkey's market will also become more competitive:

(a) with the gas release auctions currently being implemented, and

(b) linkage of demand and prices to Europe through, first, the Greece-Turkey pipeline to be in operation next year, and later the Nabucco pipeline post 2009.

These factors will lead to the development of an actual market for swing in Turkey in due course. However, in the meantime, the main approach to estimating the value of swing is international comparisons. A comparison of UK natural gas futures prices on the International Petroleum Exchange (IPE) in London, which trades up to three years ahead, shows how the value of

seasonal gas varies by around a factor of 1.5 from winter to summer. Looked at another way, futures prices for winter gas are about 20% above the annual average price and futures prices for summer gas are about 20% below the annual average price. Using the most recent figures with an average price of around US$200/thousand m^3 this would indicate that the swing between summer and winter prices is around 40% or US$80 per thousand m^3.

A further indication of the winter-summer price differential under competitive market conditions is provided by the United States. The price differential in the US is less than the UK since there is already a higher proportion of storage (underground storage accounts for 18% of total and 48% of residential consumption, but only around 10% in the UK) but still the swing amounts to approximately US$30 per thousand m^3.

Based on the above examples, we conclude that, in the near future, buyers in Turkey ought to be willing to pay between US$30-80/thousand m^3 more for winter gas compared to summer gas. To be conservative, US$40/thousand m^3 was used as an estimate of the seasonal value of storage. On this basis, the estimate of the annual seasonal value of storage starts at US$12.8 million per year (US$40 * 320Million m^3) rising to US$38.4 million per year when the storage is completed. Annualized over the project lifetime gives an equivalent benefit value of US$29.5 million per year. If instead, we use US$50/thousand m^3 as an estimate of the seasonal value of storage, the annualized benefit works out to US$36 million per year, providing an IRR of 19% as opposed to 17% in the moderate demand case (refer to table 9.1b below).

A direct comparison between the value attributed to seasonal storage and the potential tariff from Tuz Golu may not be appropriate for several reasons. The potential tariff of US$48/thousand m^3 is based on one annual turnover of the working gas, whereas in reality, the storage will see more than one turnover, in which case the tariff will be lower. Further, BOTAS will sell storage services and not the use of the facility, and therefore, its price for the service would be the blend of Kuzey Marmara and Tuz Golu, which would be a lower tariff.

A simulation was used to check that the total seasonal storage capacity of Tuz Golu would be used each year. It was found to be fully used in both demand scenarios, hence the benefit value is the same in each.

D. Operational Efficiency

When the Tuz Golu Storage Facility is delivering gas into the transmission system, which it does at high pressure, it is supporting pressure in the pipeline system and thus avoiding the need for some compressor capacity elsewhere in the system. The savings from having Tuz Golu would therefore be the capital expenditure of the compressor stations which would be required if Tuz Golu were not built and their compressor fuel and other operating expenditures. Tuz Golu is also expected to avoid the cost of a loopline that BOTAS would otherwise need to build.

BOTAS has carried out a hydraulic analysis of the transmission system in order to determine improvements that would need to be made in order to meet the expected increase in future demand. Simulations of hourly peak conditions have been carried out using the SYNERGEE

software[10] for the configuration of the system with and without Tuz Golu. In the absence of Tuz Golu, this analysis found that investment would be needed in new compression and a loopline. Specifically, BOTAS found that the most likely investment requirements without Tuz Golu would be:

- New compressors of 24MW at Afyon;
- New compressors of 48MW at Horasan; and
- New loopline of length 161km between Eskisehir and valve LV 129.

These investments would cost, in total, US$148 million[11] and should be made between 2009 and 2014. The ability of Tuz Golu to deliver high volumes at high pressure would enable the system to avoid these investments as well as the associated operating costs mostly fuel.

In the moderate demand case, the net present value of operational efficiency benefits (avoided capital and operating costs) were calculated to be approximately US$124 million, equivalent to an annualised value of US$22 million/year. In the alternative demand case the NPV was US$144 million, with an annualised value of US$25 million/year.

E. Peak Shaving

Tuz Golu storage can be used to meet the peak demand on the coldest days in a 'normal' winter, by withdrawing extra gas on those days (typically, peak shaving in an average cold year will be used for 30-45 days) and then either re-injecting gas on warmer days, and/or withdrawing gas at a slower rate on warmer days. This peak shaving roles is possible because not all the deliverability capacity of the storage facility would be used for normal winter supplies. The average withdrawal rate if spread over the four coldest winter months would be 8 million cubic meters per day, whereas the maximum deliverability is 40 million cubic meters per day (but only sustainable at that rate for 24 days). Deliverability not used for normal winter supplies is available to provide additional peak shaving capability.

The value of peak shaving could be estimated by costing any of the alternatives. In this case, and because interruptions have occurred recently (to EUAS power plants), we use the approach of valuing the cost of avoided interruption. This is estimated as:

- Estimated extra volume requirement on very high demand days, which would be at risk of interruption in the absence of storage, *multiplied by*:
- The cost of interruption, estimated as the cost of replacement fuel, which is most likely to be gas oil (for EUAS power plants).

[10] Supplied by Stoner Corp.

[11] However, we have assumed that further optimization of the system expansion plan could have found ways to reduce this cost; we have therefore applied a 25% discount to the estimate of the benefit value.

This gave an estimated net present value of the Tuz Golu peak shaving benefit of US$49 million, annualised as US$8.5 million/year, in the moderate demand case. In the alternative demand scenario the NPV was US$61million, annualised as US$10.5 million.

F. Security of Supply

The use of storage for security of supply purposes is to avoid gas shortfall due to exceptional or unexpected events such as:

- Unplanned supply restriction, e.g. failure of import supply through one of the import pipelines or LNG terminals – the greatest risk of this is currently perceived to be from Iran, which recently could not deliver the contracted quantity, although Ukraine has interrupted Russian gas flowing to Turkey in the past.
- Exceptionally poor hydro conditions (requiring increased gas fuelled electricity generation).
- Exceptionally cold winter, as might be experienced once in every 20 or 50 years.

The value of storage used to cover such an interruption is estimated by taking:

- The value per unit volume of gas of the avoided interruption, *multiplied by:*
- The probability weighted expected volume of interrupted supply covered by storage

To estimate the value of avoided interruption we start with the same basis as used for the peak shaving issue, i.e., the shortage of gas forces a shift to gas oil. The higher cost of a security of supply event compared to peak shaving interruption is allowed for in the calculation by applying a factor greater than 1, e.g. premium on cost of alternated fuel (gas oil) could de set at 2 times, instead of 1 as used for peak shaving. The present value of the probability weighted benefits from Tuz Golu security of supply coverage for an outage event of 45 days in the moderate demand scenario was estimated to be US$19.5 million, annualised as US$3.5 million per year. In the alternative demand scenario it was estimated to be US$55 million, annualised as US$9.5 million per year.

The low valuation in the moderate demand case is because the full nomination entitlements on Turkey's existing gas contracts are expected to remain higher than its demand requirements for between 10 and 20 years. As a result, until demand has sufficiently risen, the failure of one supply route could, in theory, be covered by full nomination from remaining sources for some time.

Evaluation Summary

A summary of the economic assessment of Tuz Golu is given in Table 9.1(a and b) for both the moderate and alternate demand scenarios, based on the approach outlined above:

Table 9.1a Summary of the Benefits of The Tuz Golu Storage Facility

	Storage benefit	Moderate demand $M/yr	Higher demand) $M/yr
1	Seasonal storage	29.5	29.5
2	Operational efficiency	21.5	25.0
3	Peak shaving	8.5	10.5
4	Security of supply	3.5	9.5
	Total benefits	63.0	74.5
	Cost of storage	-41.5	-41.5
	Net benefits	**21.5**	**33.0**

The estimated benefits and costs are annualized over the project lifetime at a discount rate of 11%. Values are rounded to the nearest 0.5 M.

Table 9.1b Project economic indicators

			Moderate demand	Higher demand
IRR		=	17.3%	20.1%
NPV	**@11%**	=	**$123 Million**	**$190 Million**
NPV	**@10%**	=	**$159 Million**	**$236 Million**

Net Work Expansion Investments

The project will also finance two compressor stations, one at Erzincan and one at Corum. The Corum station will have a capacity of 30 MW while the Erzincan Station will have 39 MW of compression capacity. The compressor stations are required to help transmit the increasing volumes of gas expected to be imported into Turkey from existing and new sources. The first compressor station will enable increased imports to Turkey from Iran and Azerbaijan in the medium term. The Corum compressor station would allow increased imports under the Blue Stream contract that BOTAS has signed with GAZPROM. Both these compressor stations are part of BOTAS' least cost expansion plan for its transmission system, which is considered to be a reasonable plan based on conservative estimates derived from hydraulic flow analyses of the system.

There are thus, two main benefits of the construction of the compressor stations. First, as stated above, is that the compressor stations will allow Turkey to import additional gas, and without these stations, Turkey will face a potential shortfall in gas supplies starting in 2009 (under the moderate demand case)[12]. Second, these compressor stations allow Turkey to avoid or at least reduce any take or pay liabilities under these contracts.

[12] The need for the compressor stations and the rates of return would be even higher under the high demand case.

In the absence of the compressor stations, and if no additional gas could be obtained under other existing contracts, the Turkish shortfall in supplies would have to be offset by using gas oil (light fuel oil) instead of natural gas in power plants. The benefits from using cheaper natural gas rather than gas oil far outweigh the costs of the compressors. The result is a pay back period for the compressors of about 1.5 years of operation. This implies an ERR of about 76% in real terms. Also if we assume that Azerbaijan, Iran and GAZPROM under the Bluestream contract would enforce the take or pay penalties in their contracts and require Turkey to pay for most (80%) of the gas that Turkey is not able to use due to the absence of the compressors, then the payback period would be well under one year and the rate of return would be well over 100% based on take or pay penalties alone.

If we, however, assume that the Russia, Iran, and Azerbaijan do not enforce their take or pay penalties and that all current supply sources that do not rely on the two compressor stations (Algerian LNG, Nigerian LNG, Russian Gas by the Western Route) would provide an additional 10% of the contracted amount of gas, then the rate of return on the compressor stations falls to 47% in real terms which is still a very high rate of return.

Financial Analysis of BOTAS

Past and Current Financial Performance

Profitability and cash flows BOTAS' tariffs are set by EMRA, which establishes price caps for the transmission, natural gas sales, and storage businesses. BOTAS has traditionally kept its tariffs well below the EMRA price caps. Particularly in 2004, with costs rising with oil prices, BOTAS was unable to raise tariffs commensurately, both because of the desire to keep retail gas and electricity prices down and also because of the need to retain customers in the light of the onset of competition in the near future. BOTAS overall, however, has had comfortable cash flows (as implied by the EBITDA line below) in the past, even though it has been constrained in increasing its tariffs to the price cap set by EMRA. BOTAS' cash flows have been robust largely because of the high depreciation that it has been allowed to apply (20% on most categories of assets). Depreciation rates have been reduced to a more reasonable 4.54% for a number of asset categories for investments capitalized starting 2005, which may affect cash flows in the future.

Treasury requires profitable SEEs to pay dividends on the equity capital. BOTAS, however, has in the past been allowed to retain the cash, either in the form of an equity injection or as a shareholder loan. In the future, however, it is unlikely that BOTAS will be allowed to retain the cash, which may further impact cash flows.

Table 9.2 Historical Financial Performance (2001-2004)

(US$ million)	2001	2002	2003	2004
Income Statement Summary				
Revenues	2,531.7	2,812.2	4,231.8	3,998.0
Cost of Gas Purchase	(2,144.7)	(2,304.7)	(3,618.3)	(3,395.0)
Other Costs	(27.7)	(34.3)	(39.3)	(497.5)
Gross Profit	359.2	473.2	574.2	105.5
EBITDA	491.1	727.4	957.7	435.7
Net Profit	42.3	345.8	532.1	4.2
Balance Sheet Summary				
Current Assets	1,148.24	1,819.82	3,165.75	3,899.66
Fixed Assets	1,094.43	1,162.54	1,466.66	1,367.51
Total Assets	2,242.67	2,982.36	4,632.40	5,267.17
Capital and Reserves	568.98	1,624.53	2,458.12	2,322.32
Debt	658.21	631.10	538.13	390.13
Other Liabilities	1,015.47	726.73	1,636.16	2,554.72
Total Equity and Liabilities	2,242.67	2,982.36	4,632.40	5,267.17
Financial Ratios				
Net Profit Margin	1.7%	12.3%	12.6%	0.1%
EBITDA Margin	19.4%	25.9%	22.6%	10.9%
Average Sales Price (US$/000CM)	158.05	162.57	202.21	180.93
Ave. Sales Price Change (%)	NA	2.9%	24.4%	-10.5%
Pre-Tax Return on Assets	12.0%	49.7%	55.4%	2.4%
Return on Equity	7.4%	21.3%	21.6%	0.2%
Return on Capital Employed	3.8%	16.8%	19.0%	0.2%
Self-Financing Ratio	NA	79.0%	120.8%	0.0%
Debt Service Coverage Ratio	1.9	3.9	3.3	1.4
Debt to Equity Ratio	1.16	0.39	0.22	0.17
Debt to Asset Ratio	0.60	0.54	0.37	0.29
Current Ratio	1.01	1.98	1.73	1.50
Days Receivables Outstanding	132.93	130.86	148.90	171.04
Days Payables Outstanding	35.92	18.28	22.08	47.69

Cash management BOTAS has a carefully planned cash management system to ensure that there is enough cash for paying the gas and LNG bills every month. Given that monthly gas purchases can go up to more than US$300 million, BOTAS has to ensure that this significant amount of cash is available at any point in the year. It is creditable that despite these heavy cash requirements, BOTAS has not resorted to overdrafts or other forms of working capital financing. This however is likely to change in the current year or the next, given the significant strain on its cash flows due to restrictions on allowed tariffs imposed by the Treasury and Ministry of Energy and due to the large investment program.

Overdue receivables BOTAS has had problems collecting bills from government-owned consumers, primarily EUAS and municipalities. Outstanding receivables have risen to nearly 6 months' of sales, or about US$2.2 billion in 2004. Of this about US$1.5 billion, or nearly 70% is owed by EUAS and the three main municipalities (Ankara, Izmit, and Istanbul). BOTAS is now in discussion with these institutions on collection of past receivables, which will improve their cash constraint. Currently, EUAS and municipalities pay their bills to BOTAS on time and the

overdue receivable amount from them is projected to remain stable throughout the projection period. The collection efficiency is expected to stay around 98% in the future.

Capital structure BOTAS' debt-equity ratio is a conservative 0.17, and its DSCR has been very healthy, declining to a still-healthy level of 1.4 in 2004 because of the lower revenues and operating profits. While this implies that BOTAS will have room for additional financing for its future investments, the fact that its revenues and cash flows are very uncertain has to be borne in mind. BOTAS has been able to finance its investments largely from internal resources (no equity infusions have taken place since 2002) and borrowings.

BOTAS' assets are almost entirely depreciated on account of the accelerated depreciation rates that they have used in the past. The book value of assets therefore is well below the current replacement cost of the assets. Net fixed assets of US$1.3 billion compare unfavorably with similar-sized utilities across the world. This would have had ramifications on the level of depreciation it can charge and the amount of return that BOTAS can earn, which in turn would adversely impact its cash flows and its ability to finance new investments. BOTAS has however, agreed with EMRA to use a depreciated replacement cost approach which if applied accurately, may provide BOTAS the requisite quantum of returns to be able to finance its investments.

Forecast Financial Performance

The main risks that BOTAS faces at present and in the medium term come from the constraints on raising its prices in line with rising operating and gas purchase costs. The other factors that contribute to the uncertainties in BOTAS' finances relate to the evolving structure of the industry and the advent of competition. This risk has not been quantified in the forecasts, but it may pose a risk depending on the regulatory approach to transmission and storage tariffs. Current transmission charges appear low, largely due to the low asset base on which returns are calculated. For efficient operation of the transmission and storage system, it is critical that the regulatory approach is reasonable. BOTAS proposed the use of depreciated replacement cost as the regulated asset base, and EMRA allowed this approach in 2005. This rate base calculation needs to be improved to capture the true current cost of replacement. In addition, the regulatory treatment for storage needs to be clarified (see Annex 10). The loan agreement, as a result, includes a covenant on establishing appropriate regulatory approaches towards transmission and storage (Table 9.3 below shows the returns on forecast regulated asset base as well).

BOTAS' cash flow position may not continue to be as strong in the short-term as a consequence of an increase in investments and a reduction in depreciation. Annual depreciation reduces significantly because the existing assets are almost fully depreciated and because of the revised lower depreciation rate for new assets. The cash flows improve after 2007 – the forecasts assume that BOTAS will break even on all costs over the next two years, and then will start generating healthy internal resources for investments. BOTAS will require significant external financing for its investment program over the medium term. Forecasts (summarized in the table below) show that BOTAS has the ability to borrow these amounts and service the debt comfortably.

Table 9.3 Forecast Financial Performance (2005-2012)

(US$ million)	2005	2006	2007	2008	2009	2010	2011	2012
Income Statement Summary								
Revenues	5,229	6,250	6,497	7,122	7,917	8,552	8,685	8,825
Cost of Gas Purchase	(4,727)	(5,702)	(5,971)	(6,449)	(7,112)	(7,667)	(7,810)	(7,913)
Other Costs	(428)	(440)	(324)	(312)	(357)	(378)	(386)	(404)
Gross Profit	74	108	203	360	448	507	489	508
EBITDA	315	327	298	426	536	595	575	602
Net Profit	0	1	85	206	250	294	281	299
Balance Sheet Summary								
Current Assets	2,440	2,587	2,607	2,699	2,823	2,918	2,919	2,922
Fixed Assets	1,341	1,476	1,762	2,003	2,133	2,261	2,393	2,524
Total Assets	3,781	4,063	4,370	4,702	4,956	5,179	5,312	5,446
Capital and Reserves	2,402	2,331	2,374	2,538	2,743	2,989	3,217	3,459
Debt	927	1,218	1,465	1,580	1,553	1,484	1,385	1,267
Other Liabilities	452	515	531	584	660	706	710	719
Total Equity and Liabilities	3,781	4,063	4,370	4,702	4,956	5,179	5,312	5,446
Financial Ratios								
Net Profit Margin	0.0%	0.0%	1.3%	2.9%	3.2%	3.4%	3.2%	3.4%
EBITDA Margin	6.0%	5.2%	4.6%	6.0%	6.8%	7.0%	6.6%	6.8%
Average Sales Price (US$/000CM)	208.08	213.93	201.30	202.25	202.84	203.44	202.88	203.55
Ave. Sales Price Change (%)	15.0%	2.8%	-5.9%	0.5%	0.3%	0.3%	-0.3%	0.3%
Pre-Tax Return on Assets	6.5%	9.4%	18.2%	21.6%	21.0%	24.6%	23.2%	22.9%
Return on Equity	0.0%	0.1%	3.6%	8.1%	9.1%	9.8%	8.7%	8.6%
Return on Capital Employed	0.0%	0.0%	2.3%	5.2%	6.1%	6.9%	6.5%	6.6%
Self-Financing Ratio	0.0%	1.7%	17.6%	25.7%	27.6%	28.3%	29.2%	31.4%
Debt Service Coverage Ratio	1.7	1.9	1.6	1.8	1.6	1.5	1.3	1.3
Debt to Equity Ratio	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.4
Debt to Asset Ratio	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.5
Current Ratio	4.9	4.7	4.3	3.7	3.3	3.1	3.0	3.2
Days Receivables Outstanding	136	122	119	112	106	102	101	99
Days Payables Outstanding	25	25	25	25	25	25	25	25

Demand Forecast BOTAS forecasts a significant increase in gas demand of 14% in 2005 and 16% in 2006, primarily from residential and industrial consumers, as additional gas distribution networks in cities are completed. These assumptions are among the key drivers determining the financial condition of BOTAS in the next few years. By the end of 2009, gas demand is expected to increase from 21.7 bcm in 2004 to 38 bcm, a compounded annual growth of 8% per year.

Table 9.4 Gas Demand Forecast (000 M^3)

	2005	2006	2007	2008	2009	2010	2011	2012
Residential	4,629	6,097	6,832	7,527	8,314	9,637	10,202	10,511
Industry	6,683	7,817	8,789	9,568	10,420	11,988	12,190	12,433
Electricity	12,604	14,325	15,000	16,000	18,000	18,000	18,000	18,000
Fertilizer	883	547	547	547	547	547	547	547
Export to Greece	0	21	492	737	737	737	737	737
Total	**24,799**	**28,807**	**31,660**	**34,379**	**38,018**	**40,909**	**41,676**	**42,228**

Tariff growth The other key driver in the forecasts is the assumption on tariff growth. Because of the significant increase in costs in the current year so far, the forecasts assume a 15% increase in 2005 and a 2.8% increase in 2006. Starting 2007, tariffs are forecast to rise marginally in order to provide sufficient internal resources. Tariff increase requirements would be affected by the lowering of the depreciation rate, but the enhancement in the regulated asset base would offset the adverse impact.

Investment plan BOTAS' investment program is significant in the medium term, focusing on strengthening the existing transmission network within the country, the start of the Tuz Golu storage project and completion of distribution investments in several cities. In the future, Turkey is expecting very significant investments in cross-border pipelines such as the Nabucco and Greece pipelines, but these investments are not likely to be on BOTAS' balance sheet. The projections therefore, factor in relatively moderate levels of expenditure on these projects representing BOTAS' exposure to these projects. BOTAS also has ongoing investments in city distribution networks, and though it anticipates that additional such networks will be required as new cities are connected to the gas grid, these are not currently factored into the plan below.

Table 9.5 Investment Plan (US$ million)

	2005	2006	2007	2008	2009	2010	2011	2012
Transmission	199	271	277	256	215	256	266	240
Storage	0	30	41	47	57	17	12	47
Distribution	118	110	108	53	0	0	0	0
Total	**318**	**411**	**425**	**356**	**272**	**273**	**278**	**287**

Attachment: Actual and Forecast Financial Statements

Table 9.6 Actual and Forecast Income Statement (US$ Million)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(US$ million)	Actuals				Projections							
A -Gross Sales												
Total Gas Sales					5,160	6,158	6,274	6,804	7,562	8,173	8,306	8,445
Oil Transmission					71	90	127	172	209	234	234	234
Total Domestic Sales	2,376	2,623	4,140	3,991	5,231	6,248	6,402	6,976	7,771	8,407	8,540	8,679
Export Sales	157	202	95	9	0	4	99	149	149	150	150	150
Total Gross Sales	2,533	2,825	4,234	4,000	5,231	6,253	6,501	7,125	7,921	8,557	8,689	8,829
B -Sales Discounts	-1	-13	-2	-2	-3	-3	-3	-4	-4	-4	-4	-4
C -Net Sales	2,532	2,812	4,232	3,998	5,229	6,250	6,497	7,122	7,917	8,552	8,685	8,825
D -Cost of Sales												
Purchase of Natural Gas	-2,145	-2,305	-3,618	-3,395	-4,727	-5,702	-5,971	-6,449	-7,112	-7,667	-7,810	-7,913
Cost of Services	-28	-34	-39	-498	-428	-440	-324	-312	-357	-378	-386	-404
Total Cost of Sales	-2,172	-2,339	-3,658	-3,893	-5,155	-6,142	-6,295	-6,762	-7,469	-8,046	-8,196	-8,317
Gross Sales Profit	359	473	574	106	74	108	203	360	448	507	489	508
E -General and Admin. Expenses	-4	-4	-5	-17	-16	-17	-17	-18	-18	-19	-20	-20
Profit from Main Operating Activities	355	470	570	89	58	92	186	342	429	488	469	488
Depreciation In Cost of Sales	136	258	388	347	257	236	113	84	107	108	106	114
EBITDA	491	727	958	436	315	327	298	426	536	595	575	602
F -Income & Gains from Other Operating Activities	127	216	285	148	47	36	32	32	32	32	31	31
G-Expenses & Losses from Other Operating Activities	-322	-27	-137	-187	-12	-17	-17	-19	-22	-23	-23	-24
H -Financial Expenses												
Total Financial Expenses	-81	-106	-19	-24	-64	-76	-81	-89	-92	-91	-88	-83
Operating Pfofit / (Loss)	79	552	698	26	28	35	119	266	348	405	389	412
I - Extraordinary Income And Gains	24	58	21	16	20	24	25	28	31	33	34	34
J - Extraordinary Expenses And Losses	-41	-135	-35	-37	-48	-58	-60	-66	-73	-79	-80	-82
Income For The Period	62	475	685	4	0	1	85	228	305	359	342	365
K -Income Tax	-20	-129	-152	-0	0	0	0	-22	-55	-65	-62	-66
Net Income For The Period	42	346	532	4	0	1	85	206	250	294	281	299

Table 9.7 Actual and Forecast Cash Flow Statement (US$ Million)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(US$ million)	Actuals				Projections							
Cash flows from operating activities												
Profit before taxation and monetary gain	**62**	**475**	**685**	**4**	**0**	**1**	**85**	**228**	**305**	**359**	**342**	**365**
Add Back Depreciation and Amortization	136	258	388	349	257	236	113	84	107	108	106	114
Add Back Provisions	256	-63	0	-5	12	17	17	19	22	23	23	24
Add Back Interest Expense	30	21	19	19	50	65	76	84	86	84	82	77
Add Back F/X (Gain)/ Loss	30	85	5	20	14	10	5	5	6	7	7	7
Tax Paid	67	-92	-160	-117	-57	0	0	0	-22	-54	-63	-61
Operating profit before working capital changes	**581**	**683**	**936**	**270**	**276**	**329**	**296**	**420**	**504**	**527**	**497**	**525**
Net working capital changes in:												
Trade and other receivables	-669	-144	-565	-46	-190	-212	-76	-141	-173	-151	-70	-72
Inventories	-31	-37	-132	171	-58	-25	-8	-16	-20	-17	-6	-6
BTC Prepayments and other current assets	-0	-250	-432	-953	1,488	0	0	0	0	0	0	0
BTC Trade and other payables and other current liabilities	287	-119	853	780	-1,664	76	25	40	53	47	19	16
Other non current liabilities and accrued expenses	34	46	-37	-84	0	0	0	0	0	0	0	0
Net cash provided by operations	**202**	**179**	**622**	**139**	**-148**	**169**	**238**	**303**	**364**	**406**	**439**	**463**
Cash flows from investing activities												
Purchase of property and equipment	-502	-101	-225	-219	-318	-411	-425	-356	-272	-273	-278	-287
Investment advances	-5	-13	13	-6	5	0	0	0	0	0	0	0
Investments in Securities	-5	-247	123	5	0	0	0	0	0	0	0	0
Net cash used in investing activities	**-512**	**-361**	**-90**	**-220**	**-313**	**-411**	**-425**	**-356**	**-272**	**-273**	**-278**	**-287**
Cash flows from financing activities												
Increase in Capital Shares	0	157	0	0	0	0	0	0	0	0	0	0
Loans Drawdown (net of repayment until 2005)	312	51	-201	-170	646	405	355	266	189	197	198	199
Repayment of Loans	0	0	0	0	-135	-97	-92	-129	-195	-245	-278	-298
Debt to Shareholders	0	0	-274	0	0	0	0	0	0	0	0	0
Interest Expense Paid	-30	-21	-19	-19	-50	-65	-76	-84	-86	-84	-82	-77
Other Long Term Liabilities	3	-0	0	0	0	0	0	0	0	0	0	0
Net cash provided by financing activities	**285**	**187**	**-494**	**-188**	**461**	**243**	**188**	**53**	**-91**	**-132**	**-161**	**-176**
Monetary Adjustment	107	191	-11	64	0	0	0	0	0	0	0	0
Net Change in Cash and Cash Equivalents	**82**	**196**	**28**	**-205**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Cash and cash equivalents at beginning of year	**6**	**88**	**274**	**348**	**157**	**157**	**157**	**157**	**157**	**157**	**157**	**157**
Cash and cash equivalents at end of year	**88**	**284**	**302**	**143**	**157**	**157**	**157**	**157**	**157**	**157**	**157**	**157**

Table 9.8 Actual and Forecast Balance Sheet (US$ Million)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
(US$ million)	Actuals				Projections							
I-Current Assets												
A-Liquid Assets	**88**	**274**	**348**	**157**	**149**	**144**	**142**	**139**	**137**	**134**	**132**	**129**
B-Securities	**26**	**270**	**194**	**197**	**187**	**181**	**178**	**175**	**172**	**169**	**166**	**163**
C-Commercial Receivables	**939**	**1,030**	**1,766**	**1,899**	**1,975**	**2,111**	**2,132**	**2,216**	**2,328**	**2,415**	**2,419**	**2,425**
Trade Receivables	306	413	589	718	859	1,027	1,068	1,171	1,301	1,406	1,428	1,451
Deposits and Guarantees Given	17	21	39	25	21	22	21	21	21	21	21	21
Other Commercial Receivables	616	595	1,137	1,155	1,094	1,061	1,042	1,024	1,006	988	971	953
Doubtful Commercial Receivables	272	174	205	209	211	222	235	250	268	286	305	323
Reserve for Doubtful Receivables (-)	-272	-174	-205	-209	-211	-222	-235	-250	-268	-286	-305	-323
D-Other Receivables	**4**	**11**	**17**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
E-Inventory	**44**	**75**	**220**	**58**	**113**	**135**	**140**	**154**	**171**	**185**	**187**	**190**
F-Other Current Assets	**46**	**160**	**621**	**1,584**	**12**	**11**	**11**	**11**	**11**	**11**	**10**	**10**
Total Current Assets	**1,148**	**1,820**	**3,166**	**3,900**	**2,440**	**2,587**	**2,607**	**2,699**	**2,823**	**2,918**	**2,919**	**2,922**
II-Fixed Assets												
A-Tangibles Fixed Assets	**1,023**	**1,092**	**1,366**	**1,198**	**1,197**	**1,305**	**1,603**	**1,836**	**1,982**	**2,125**	**2,264**	**2,401**
Tangible Fixed Assets	1,303	1,893	2,944	2,847	2,852	2,920	3,170	3,751	4,231	4,240	4,331	4,498
Accumulated Depreciation	-610	-967	-1,777	-2,079	-2,224	-2,383	-2,445	-2,472	-2,522	-2,573	-2,629	-2,691
Investment in Progress	331	166	198	430	569	768	878	557	273	458	562	595
B-Intangible Fixed Assets	**1**	**1**	**5**	**4**	**3**	**35**	**25**	**35**	**22**	**9**	**5**	**0**
C-Other Fixed Assets inl. Receivables	**71**	**69**	**96**	**165**	**141**	**137**	**134**	**132**	**130**	**127**	**125**	**123**
Total Fixed Assets	**1,094**	**1,163**	**1,467**	**1,368**	**1,341**	**1,476**	**1,762**	**2,003**	**2,133**	**2,261**	**2,393**	**2,524**
Total Assets	**2,243**	**2,982**	**4,632**	**5,267**	**3,781**	**4,063**	**4,370**	**4,702**	**4,956**	**5,179**	**5,312**	**5,446**
III-Short-Term Liabilities												
A-Principal Payments of Long-term Credits	**156**	**226**	**243**	**134**	**100**	**93**	**132**	**199**	**249**	**283**	**304**	**236**
B-Commercial Liabilities	**241**	**148**	**354**	**522**	**362**	**428**	**446**	**478**	**523**	**560**	**569**	**576**
Trade Payables	211	115	219	444	324	391	409	442	487	525	535	542
Other Commercial Liabilities	30	32	135	79	39	38	37	36	36	35	34	34
C-Other Liabilities	**744**	**545**	**1,237**	**1,936**	**35**	**34**	**33**	**55**	**87**	**96**	**93**	**96**
Total Short-Term Liabilities	**1,141**	**918**	**1,834**	**2,592**	**497**	**555**	**611**	**731**	**859**	**939**	**966**	**908**
IV-Long-Term Liabilities												
A-Financial Liabilities	**502**	**405**	**295**	**256**	**827**	**1,124**	**1,333**	**1,382**	**1,304**	**1,201**	**1,081**	**1,031**
B-Other Long-Term Liabilities	**32**	**34**	**45**	**97**	**55**	**53**	**52**	**51**	**50**	**49**	**48**	**48**
Total Long-Term Liabilities	**534**	**439**	**341**	**353**	**882**	**1,177**	**1,385**	**1,433**	**1,354**	**1,251**	**1,130**	**1,079**
V- Equity Capital												
A-Paid-In Capital	**104**	**782**	**923**	**1,369**	**1,498**	**1,453**	**1,428**	**1,402**	**1,378**	**1,353**	**1,329**	**1,306**
Capital	104	782	923	960	1,111	1,078	1,059	1,040	1,022	1,004	986	968
Inflation Adjustment	0	0	0	409	387	375	369	362	356	350	343	337
B-Capital Reserves	**168**	**335**	**690**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
C-Profit Reserves	**114**	**122**	**312**	**1,168**	**1,106**	**1,073**	**1,077**	**1,106**	**1,109**	**1,116**	**1,122**	**1,130**
Legal Reserves	114	122	312	1,118	1,059	1,027	1,026	1,040	1,022	1,004	986	968
Statutory Reserves	0	0	0	50	47	46	51	66	88	113	136	161
D-Retained Earnings	**183**	**386**	**532**	**-215**	**-203**	**-196**	**-131**	**29**	**256**	**519**	**765**	**1,024**
Total Of Stockholders' Equity	**569**	**1,625**	**2,458**	**2,322**	**2,402**	**2,331**	**2,374**	**2,538**	**2,743**	**2,989**	**3,217**	**3,459**
Total Liabilities	**2,244**	**2,982**	**4,632**	**5,267**	**3,781**	**4,063**	**4,370**	**4,702**	**4,956**	**5,179**	**5,312**	**5,446**

Annex 10: Framework for Regulation of Natural Gas Storage

TURKEY: GAS SECTOR DEVELOPMENT

This section identifies the regulatory issues and proposes the main principles on which storage regulation should be based. This also allows assumptions to be made on the pricing and revenues from storage that are used in the financial analysis in Annex 9.

A. Principles of storage regulation

There are two parts to the regulation of storage tariffs:

- **Allowable costs**. The costs of storage that can be recovered as allowable revenue through charges.
- **Charges**. The tariffs, their level, structure and who pays.

However, before these items can be calculated, the principles on which they will be determined need to be established.

Storage will be a new activity in Turkey and, as yet, EMRA has not established the detailed principles on which storage will be regulated. However, the structure of gas storage costs is similar to transmission; i.e. it is almost all fixed cost. Furthermore, while storage fulfils a number of functions in the gas system, one of its key roles is to support the reliable and secure operation of the transmission system. Therefore a sensible starting point for developing storage regulation principles is to be consistent with the principles for transmission regulation[13]. As accounting separation is fully implemented and new importers enter the market, open access tariff arrangements may be considered

Regulation of Capital Costs

Since the major part of cost is fixed cost, the key regulation parameters and methods are those which deal with allowed capital costs, i.e., the allowed annual costs of using the assets.

In cost of service regulation, which is the most common approach to regulation of unbundled activities, allowed capital cost is determined by two key factors in the following formula, allowed rate of return and depreciation rate:

Capital Costs	=	**Depreciation + ROR x RAB**
Where:		
Depreciation	=	Depreciation rate x RAB
ROR	=	Allowed rate of return on assets (RAB)
RAB	=	Regulatory asset base
In each year t:		
RAB_t	=	RAB_{t-1} – $Depreciation_t$ + Allowed new $assets_t$

[13] This does not necessarily mean that the principles have to be identical.

The details of the calculation procedure are also important, such as when new assets are allowed into the RAB and the treatment of inflation.

Transmission capital cost regulation – RAB and depreciation

BOTAŞ originally proposed that their existing assets should be valued at the estimated new replacement cost for equivalent assets. However, as this ignores age of assets and depreciation, the basis accepted by EMRA was an approximate inflation adjusted, depreciated historic value, calculated as follows:

- The historic costs of assets in TL were adjusted (increased) by the change in the US$-YTL exchange rate. This is equivalent to adjusting historic costs by the difference in Turkish and US inflation rates, although it does not adjust for US inflation.
- Depreciation at the normal rates was applied to the adjusted asset values. Effectively, this gives the depreciated historic asset costs in US$.

Compared to a replacement cost basis, it should be noted that this does not account for:

- Productivity gains in pipeline investments, such that the same pipe today might be laid for a lower (or different) cost than the original;
- Change in costs of input factors, especially the price of steel (which has risen substantially in the last 3 years);
- The effect of excessive depreciation.

The first two factors are difficult to assess and many regulators prefer to ignore these adjustments (until better data is available).

The third factor, **depreciation rate**, is important. Until 2004, the tax rules allowed the principal BOTAŞ assets to be depreciated over 5 years, i.e. at 20% per year of original cost on a straight line basis. EMRA had accepted this tax rule as the depreciation rate for regulatory purposes as well[14]. It should be noted that this is highly excessive since pipeline lifetimes are generally assumed to be around 30 years plus and depreciation rates well under 5% are common.

The effect of a high rate of depreciation is that the existing asset base is very small in relation to the cost of new assets. New assets dominate the total asset base and largely determine the return on assets which BOTAŞ receives. Excessive depreciation leads to the need to keep new capital spending high in order to maintain and increase the return on assets. It also means that current consumers are paying many of the costs for assets which will be used for the benefit of future consumers[15]. However, it does, conversely, encourage investment.

The new tax rules applying from 2005 onwards are that BOTAŞ' principal assets should be depreciated over 22 years, giving an annual straight line depreciation rate of approximately 4.54% per year. This is much closer to the real cost of the assets, although still a little high (as lifetimes can be expected to exceed 22 years). This will go a considerable way towards

[14] It is common, in other countries, for rate-making and accounting to use different depreciation rates from those used for tax purposes.

[15] Once the assets are fully depreciated, their continued use imposes no additional cost on consumers.

correcting the distortion in future between old and new assets in terms of capital costs. Although an argument could be made for a lower rate than 4.54%, the new rate is an improvement on the old one.

EMRA have confirmed that US inflation adjustment will be applied to the total asset base in future. Again, this is not the full level of adjustment that would be recommended, but as a second best approach it is considerably preferred to having no international inflation adjustment at all.

The RAB is not increased as expenditure occurs, but when each project is completed. New assets enter RAB at the end of the month in which they are completed. We assume this means that the return on assets is calculated for each month of the year taking account of depreciation and new assets on a monthly basis. This is important since some new projects will produce a large change in RAB and the timing of their inclusion can have a large impact.

Transmission capital cost regulation – ROR

The other key regulatory parameter is the allowed rate of return on assets[16]. BOTAŞ requested an 11% IRR after tax and depreciation, in real terms for their transmission system. Given a depreciation rate of 4.5%, and an assumption that no taxes will be paid (rate = 33%) until 2010, they calculated that the real pre-tax rate of return on assets they required would be 9.5%[17].

EMRA have attempted to use the capital asset pricing model (CAPM) to assess the reasonable rate of return on equity for an enterprise like BOTAŞ, and hence to come up with a weighted average cost of capital (WACC) as a basis for determining allowable ROR for an enterprise like BOTAŞ. The shortage of relevant data for comparable companies in Turkey (there are no large quoted utilities) meant that they were unable to carry out a robust calculation, but they have indicated that a real pre-tax ROR of around 10% appears reasonable given the sector and country risks in Turkey compared to other countries. Therefore BOTAŞ' request of 9.5% was acceptable to EMRA.

B. Storage capital costs regulation

The comments above on the principles for transmission capital costs regulation recommend improvements in the approach. However, it would be anomalous if storage capital costs were regulated significantly differently from transmission capital costs[18]. Therefore it is preferable to accept the main principles of transmission capital cost regulation as the starting approach for storage, and (re)state here the principles as applied to storage regulation.

- The allowable costs of new assets (in the case of storage there are no existing assets, excluding LNG) are added to the RAB in the month of completion, including capitalized ROR during construction;

[16] Regulation can also be applied on the basis of a rate of return on equity, with the costs of debt financing treated as a cost pass-through. However, return on assets (ie the RAB) is perhaps more suitable for a state owned enterprise where the capital structure may not be treated the same way as in the case of a private company.

[17] It should be noted that if BOTAŞ were to pay tax at 33% for all years prior to 2010, the required ROR to achieve an 11% IRR would need to increase to about 11.5%.

[18] Especially while BOTAŞ remains effectively an integrated utility.

- Depreciation on existing assets is applied at the rate of 4.54% pa (more precisely, 1/22);
- RAB is adjusted each year in line with inflation (for the time being, this will be the difference between TL and $ inflation, but should ideally be total inflation);
- The return on assets is calculated using an allowed ROR set as a real and pre-tax rate of return;
- The above calculations should be carried out using equivalent monthly rates separately for each month since new assets can enter the RAB at the end of any month.

The Tuz Golu storage facility will require cushion gas volumes of about 50% of the working gas volume. The cushion gas is expected to be recovered at the end of the economic life of the storage facility. The cushion gas value therefore will not be depreciated, but will be included in the RAB for calculating the return for BOTAŞ. The cushion gas should be valued at the expected WACOG at the time the storage will be filled, as this is the opportunity cost of the gas. The principles for storage tariff regulation therefore should also include the following on the treatment of cushion gas:

- Cushion gas should be included as an asset in the RAB and a return calculated based on its opportunity cost value at the time of filling storage and the ROR. It need not be depreciated provided it can be extracted at the end of the storage lifetime.

ROR on Storage

A rate of return of 11% is suggested, which is higher than that currently applied to the calculation of BOTAŞ' transmission tariffs. The reasons for this proposed rate are:

- Compared to the 9.5% currently assumed for transmission, if BOTAŞ were to pay tax at 33% for all years, their rate would have to be increased by about 2% to yield the same after tax return. For storage, it is assumed that tax will be payable on all profits.
- EMRA have indicated that a slightly higher rate might be acceptable, which presumably is consistent with their calculations of cost of capital for this type of activity.
- A number of international comparators were obtained. The proposed rate of 11% is within the range of RORs adopted by regulators for comparable situations.
- The riskiness of storage is probably higher than for transmission. Transmission is a regulated monopoly whereas storage services will eventually be in competition with each other.

More details of the proposed approach to regulation are given in the next two subsections, covering allowed costs and charges.

C. Draft regulation on storage

Although regulated storage tariffs for Tuz Golu will not be needed until it is put in operation in 2009, BOTAŞ needs to know now (i.e. before it commits the investment expenditure) what revenues and return it will be allowed to earn on its investment.

Similarly, EMRA is presumably hoping that more storage investment will occur in order that the minimum 10% of consumption requirement set in the NGML can be met. Other potential investors and lenders will also need to know what revenues storage can be expected to earn.

It is therefore important that early in the process of construction of the storage, EMRA puts in place a statement, in the form of a regulation or at least a draft regulation, setting out the broad principles it will apply to storage regulation, particularly tariffs. The principles set out above, and the details elaborated below, can provide BOTAŞ with a starting point for its draft proposal to EMRA. BOTAŞ has agreed to submit a proposal with the principles of storage regulation to EMRA for its review by January 2009.

Allowable costs and revenues

The proposed method for regulating allowed costs and revenues is a multi-year cost of service approach using the principles for capital costs outlined above:

- Capital expenditure projects should be approved by EMRA on an *ex ante – ex post* basis, i.e. the costs should be approved in advance and then reviewed afterwards. Any deviations of *ex post* cost from *ex ante* would have to be fully justified and not necessarily allowed in full by EMRA into the regulatory asset base (RAB).
- Assets enter the RAB at the end of the month in which the project is completed. The allowable asset value should include rate of return on assets during construction. The RAB should be adjusted each year for inflation.
- Annual capital costs would comprise depreciation plus allowed return calculated as *ROR x RAB*. Depreciation rates should ideally be set on the economic lifetime of the facility, say 30 years or more, but initially can use the rate of 4.5% as applied to transmission, based on the tax rules. It is proposed that 11% be used for the ROR.
- Operating expenditure (opex) comprises mostly fuel for compressors and some other operating and maintenance costs. Fuel cost is a largely uncontrollable cost and it should therefore be allowed as a pass through item. Since the rest of opex is small, it can also be passed through. In the future, an incentive based method (price cap) could be applied to non-fuel opex.
- The allowed cap costs should be treated as a revenue cap; if BOTAŞ over-recovers (or under-recovers) its costs through the tariffs in one year, a balancing adjustment should be made to allowable revenues in the next year. One way to do this and take account of the need to apply a rate of return to the under- or over-recovery is to treat the adjustment as a capitalized item and include it in RAB. The annual adjustment in RAB for year t would then be:

$RAB_t = RAB_{t-1} * (1+ Infl\%) - Depreciation_t + Allowed\ new\ assets_t + RevAdj_t$

where:

$RevAdj_t$ = Amount of allowed revenue not recovered in year t-1 (+ve) or amount over-recovered (-ve)

$Infl\%$ = Inflation adjustment

The analysis of costs should be forward-looking to ensure that allowed revenue covers future costs. A multi-year framework is desirable since capital expenditure can

be 'lumpy' (occasional large expenditures) and allowed revenue should be smoothed out over a number of years to enable prices to be stable. BOTAŞ should therefore produce an annual rolling 10-year business plan for its storage activity and project allowable costs and revenues on that basis. Allowed revenues can be smoothed out compared to allowed costs; the two projections (costs and revenues) should produce the same NPV calculated at the allowed ROR.

Storage tariffs – charging for use of storage

Once the allowable revenue is set on the basis laid out above, the tariff structure will establish how, and from whom, BOTAŞ recovers those revenues. The approach to setting storage tariffs should be based on the role Tuz Golu storage will play in the system, how (and who) will use it, the services it can charge for, and the structure of the gas market.

There are potentially many ways that storage costs could be recovered, eg:

- bundled into the price for commodity gas, i.e. the wholesale gas price,
- bundled into the price for transmission,
- bundled into a price for peak or seasonal gas,
- a combination of the above,
- Unbundled, and sold as a separate service to others, e.g. importers, shippers or consumers.

The principles of structuring tariff charges are briefly discussed in the following sub-sections.

D. Current market

Prior to the development of wholesale gas competition, the simplest cost recovery approach is for BOTAŞ to adopt one of the first 3 options. In fact, the current approach to setting the wholesale gas price is to sum three components: the weighted average cost of imports (WACOG) + cost of storage[19] + cost of transmission. It would be straightforward to incorporate the allowed revenues for Tuz Golu (as well as for North Marmara) into this calculation.

The 'cost of storage' should include the allowed revenue for Tuz Golu divided by the forecast of total wholesale gas sales to give a cost per unit of gas. As this will introduce a market risk that allowed revenue would not be fully recovered (due to a demand forecast error) there should be a revenue adjustment to RAB each year as set out above.

E. Future market

However, since the aim is to move towards a competitive gas market, which requires that third parties have access to storage facilities, and since both BOTAŞ as the transmission and system balancing company, and gas shippers will wish to use storage services, it is reasonable that storage should be offered as an unbundled service once competition starts. Also EMRA will probably enforce the license requirement that BOTAŞ should fully separate the accounts for the storage activity.

[19] Cost of storage to date refers, in fact, to the cost of using the LNG terminal.

Storage would then be regulated as a separate activity with accounting separation at least. Thus the storage unit of BOTAŞ would charge the wholesale supply unit of BOTAŞ for use of storage, as well as charging any other importer that requires access to storage (for commercial reasons or to meet its requirement to have access to storage equal to 10% of its annual import volume[20]).

The tariff regime for Kuzey Marmara has been set at a charge (to BOTAŞ) of $12.75/ thousand m^3 on entry and the same on exit. Since BOTAŞ has paid for the cushion gas (at a reduced price of $80/ thousand m^3), the single cycle cost of the storage to BOTAŞ is about $30.5/ thousand m^3, assuming that the full volume of the storage is used each year for seasonal storage (with some security of supply benefits as well).

However Tuz Golu is a more flexible storage than Kuzey Marmara. It will provide additional services, i.e. peak shaving and operational efficiency, and a different tariff approach should be used, as some gas may be cycled in and out several times during winter. Since Tuz Golu is likely to be used for more than a single cycle it is not reasonable to pay repeatedly for injections and withdrawals at such high rates. Different shippers would make different use of storage (seasonal, short term etc) while BOTAŞ will also use it for system balancing and security of supply.

In order to accommodate difference storage services and charge for each on a cost reflective basis, three components of storage services should be offered:

(a) Storage volume, i.e. capacity,
(b) Injection,
(c) Withdrawal.

The proposed basis for determining storage charges for Tuz Golu would be:

Storage volume - capacity charge	*Revenue cap used to set a price per unit volume of storage capacity. Allowed revenues in the revenue cap will be capital costs plus any fixed cost elements of operating costs. Based on expected uptake of storage capacity (100%) on a single cycle.*
Injection and withdrawal - variable charges	*Initially a cost pass through, with most of the variable costs allocated to injection (i.e. pumping), as the costs of withdrawal are very small. Later moving to a price cap per unit volume of injection and withdrawal, to give an incentive to improve efficiency.*

It should be noted that EMRA has the intention of making storage a competitive activity, but so long as BOTAŞ has a monopoly or dominant position in storage facilities, BOTAŞ' storage prices and access will need to be regulated.

[20] Since there may not be physical storage capacity in Turkey equal to 10% of total imports for the foreseeable future, EMRA have indicated that they would impose the storage requirement on importers pro rata to their share of total.

Annex 11: Safeguard Policy Issues

TURKEY: GAS SECTOR DEVELOPMENT

The three main safeguard policy issues addressed include:

I. Social safeguards
II. Environment
III. Dam Safety

In addition, an independent seismic assessment was also conducted.

I. SOCIAL

The overall social impact of this project will be positive since the main component, the gas storage at Tuz Golu, will increase the availability of natural gas during the winter heating season and reduce the possibility of interruptions in supply. The project will also expand the transmission capacity of the Turkish gas transmission system thus allowing the increased imports and use of natural gas which tends to replace much more polluting fuels.

Landowners, both private and public, will be affected directly by the construction of pipelines, pump stations and storage tanks and the gas storage field, but the overall impact will be minimal. The pipelines travel through the territory of 27 villages, but will be located away from the settlements, thus causing no resettlement. The area is sparsely populated, overall, and the pipeline route is virtually unpopulated. The population lives in small compact settlements separated by vast open spaces used for extensive grain cultivation or grazing, where agricultural production is viable, or simply not used at all, particularly southeast and south of Tuz Golu.

Landowners will experience one or more of three types of direct impact:

- Temporary easement for access during pipeline construction, after which the land is restored to its original condition;
- Permanent easement (from 10 to 38 m. wide), disrupted during construction, after which it is returned to its original condition, but carrying permanent restrictions on land use to avoid damage to the pipe;
- Land acquisition—small parcels for pump stations and storage tanks, and larger tracts for the storage area. Private owners will be compensated differently for easements and land purchase; the need for compensation for state and Treasury lands depends on the status of the land and its use requirements.

Except for the few places where land needs to be acquired, BOTAŞ will merely acquire 49-year **easement rights**, which restrict owners from growing trees or building structures on the easement land. Otherwise, landowners will be able to continue using their lands except for during the immediate construction period. The easement requirements can be divided into four distinct segments are as follows:

(a) **Hirfanlı Reservoir to gas pipeline** The new fresh water pipeline from Hirfanlı Reservoir to the gas pipeline, 35.9 km., will require easement rights 16 meters wide, totaling 57.6 ha. The land for pumping stations and storage tanks will be acquired. A pumping station will be constructed at the intake point, on State land, and another one at the highest point of the route near the gas pipeline and a third

along the route. Three water storage tanks will be constructed, two of which at the site of pumping stations. The total land acquired is less than 1 ha;

(b) **Gas pipeline alignment** The freshwater pipeline will run parallel to the gas pipeline for 60 km., for which an easement of 10 meters will be required along the route, totaling 61 ha;

(c) **Gas pipeline to storage site** All three pipelines (fresh water, brine and new spur of the gas pipeline) will run parallel, requiring an easement of 28 m for a distance of 23.2 km. totaling 65 ha.;

(d) **Gas pipeline to Tuz Golu** The brine pipeline will continue from the gas pipeline to the discharge point at Tuz Gölü, 16.7 km., requiring a 16-meter easement, totaling 26.8 ha. A pump station and loading tank will be constructed along the pipeline, for which the total land to be acquired is less than 0.5 ha.

Land Acquisition Plan BOTAŞ prepared a Land Acquisition Plan for the project. It was reviewed and found acceptable to the Bank, which was disclosed through discussions in affected villages. BOTAŞ will implement the Land Acquisition Plan and will directly manage the process of acquiring easements and land and thereafter monitoring the work of contractors to ensure that they stay within the agreed tracts. BOTAŞ utilizes professional assessors to valuate the parcels and crops. They prepare a valuation report for each parcel, which is used as the basis for direct discussions with owners. Private owners are paid quickly upon reaching agreement and official transactions (transfer of title and/or registration of easement restrictions on titles) must be completed before civil works can begin. BOTAŞ gained considerable experience working under provisions of OP/BP 4.12 during the design and construction of the Baku-Tbilisi-Ceyhan Pipeline, thus the Bank team is confident that the plan will be implemented well. The Entitlement Matrix is attached as Table 11.1 at the end of this section.

The gas compressor stations at Corum and Erzurum respectively will each require a site of approximately 30 by 40 meters. This land acquisition, and others currently unforeseen, will be covered by the Resettlement/Land Acquisition Policy Framework that BOTAŞ prepared and disclosed prior to completion of appraisal.

Consultation and Disclosure Stakeholder identification and consultations were initiated early in the process of preparing the EIA, followed by disclosure of the Land Acquisition Plan. Directly affected land owners will be contacted individually during land acquisition activities. National NGOs will be informed and their feedback will be sought on various occasions.

The local level meetings held in March 2005, including the sub-governors (kaymakam) and village consultations, focused on land issues. The most common issues raised by the sub-governors and village legal self government (muhtar) include the following:

- Land expropriation and compensation (private, pasture lands, crops and assets etc)
- Damage to infrastructure (roads, irrigation channels, etc)
- Reinstatement of land status after construction (this was raised especially by the Muhtars of the villages located along the existing gas line route)
- Impacts on livelihoods (i.e. animal husbandry; access to grazing lands)

Officials and residents were assured that expropriation would be minimized, compensation would be paid promptly and fully, infrastructure damage will be avoided or repaired, lands will be returned to their pre-construction status and the pipelines are not expected to affect grazing areas permanently and temporary losses will be compensated.

Monitoring and Evaluation BOTAŞ will report semi-annually on land acquisition progress and problems and Bank staff will conduct field visits regularly during supervision. The pipeline will have insignificant impact on individual households, so precise household-level monitoring and evaluation is not appropriate. The status of landowners in the storage area will be assessed, however, although it appears that few private owners will be affected.

The monitoring will verify that:

- Actions and commitments described in the Land Acquisition Plan are implemented fully and on time;
- Eligible affected people receive their full compensation entitlements within agreed timeframes;
- Complaints and grievances lodged by project affected people are followed up and that where necessary, appropriate corrective actions are implemented;
- If necessary, changes in LAP procedure are made to improve communications and the delivery of entitlements to project affected people.

BOTAŞ Surveying and Land Acquisition Department will be responsible for monitoring and reporting land acquisition activities within the framework of the Land Acquisition Plan.

Table 11.1 Entitlement Matrix

Investment	Component	Action	Category of Project Affected Person	Entitlement
Pipeline	Buried Pipeline (210 ha.)	Permanent Easement	Private Owner[21]	35% of land value (net income methodology)
			Treasury	Agreed concession
	TBD	Temporary Easement	Private Owner	10-20% of land value (net income methodology)
			Treasury	Agreed concession
	Pump Stations, Storage Tanks (approx. 0.9 ha.)	Purchase	Private Owner	Land value (net income methodology)
			Treasury[22]	Land value, negotiated
	Brine Reservoir (Approx. 2 ha.)	Purchase	Private Owner	Land value (net income methodology)
			Treasury	Land value, negotiated
Gas Storage Facility	Cavern Area (Approx. 605 ha.)	Purchase	Private Owner	Land value (net income methodology)
			Treasury	Land value, negotiated
	Surface Facilities (Approx. 16.5 ha.)	Purchase	Private Owner	Land value (net income methodology)

[21] Permanent Easements are registered on land titles. The easement restricts any activity which would cause or lead to damage to the pipeline, including the following: construction of buildings or assets; planting trees; construction of new irrigation or drainage ditches; boreholes; changes to the ground profile; changes to the profile of areas that affect the easement area; decrease in depth of soil cover over the pipeline; locating substances such as rubbish, waste or detritus.

[22] The following applies to all lands registered in the name of Treasury or unregistered lands in the possession and jurisdiction of State. Registered Treasury lands are purchased; unregistered lands are used without compensation.

			Treasury	Land value, negotiated

II. ENVIRONMENT

The Tuz Golu Basin Underground Natural Gas Storage Project (UNGSP) will create a series of underground gas storage caverns by controlled fresh water dissolving of portions of the extensive underground natural salt formations existing at a depth of approximately 1000 m.

To establish technical feasibility of the Tuz Golu salt structure, BOTAŞ evaluated seismic characteristics of the site, mechanical characteristics of the salt cores, and hydrological requirements for leachate water supply and brine disposal. A detailed environmental impact assessment (EIA) study was conducted to satisfy Turkish Environmental regulatory requirements. The EIA was officially approved by the Ministry of Environment and Forestry (MoEF) on 19.08.2003.

Environmental Impact Assessment (EIA) Process
An EIA was prepared in strict accordance with Turkish Environmental Legislation and approved by the Turkish Ministry of Environment and Forestry (MoEF). An EIA supplement (EIA Annex) was also prepared by BOTAS to address the change in fresh water supply and additional information requirements needed to satisfy World Bank EA policies and procedures (OP/BP/GP 4.01). Thus the Turkish EIA together with the supplement fully satisfies both Turkish and World Bank EA requirements.

Public consultation for the Turkish EIA was conducted at Sultanhani Municipality on 27.03.2003 and a second public consultation for both the Turkish EIA and the EIA Annex was conducted at Agaçören Municipality (close to the water supply line) and Sultanhani Municipalities on 24.03.2005. A Turkish language version of the EIA documents, including EIA Annex was disclosed locally at Sultanhani Municipality and BOTAŞ web site on June 1, 2005 (The English language version was received by the World Bank on June 6, 2005 and deposited in the World Bank Infoshop on July 8, 2005).

An independent Turkish Environmental Consultant accredited by MoEF prepared the EIA study on behalf of BOTAŞ. It was approved by MoEF in 2003. The water supply modification scenario required BOTAŞ to supplement the EIA by adding an addendum according to the Turkish EIA Regulation, which was approved by MoEF.

Baseline Assessment
Environmental resources at the project site were assessed by the EIA project team. Comprehensive studies determined local air, water and soil quality and biological resources. Turkish seismic experts carried out studies within an area of 73 km^2 surrounding the project site and determined it to be one of the most stable regions in Turkey, with the lowest seismic risk: an earthquake in the project site is most unlikely to occur, thus risk of failure from an earthquake is low. In addition, an internationally recognized seismic expert assessed the situation and also determined that the depth and strength of the salt domes make failure probability extremely low, and introduce a risk similar to installations world-wide.

Factors used in selecting the proposed project site are:

- Proximity to the existing main gas pipeline;
- Convenience in natural cavern formation and drainage processes;
- Lowest seismic risk region in Turkey;
- Very low agricultural potential in the region.

Air Quality There are no significant emission sources within the project site and its vicinity. Since the project region is a rural area, present air quality depends upon emissions that originate from sources used for heating purposes (i.e. coal) and soil. There are few settlements at or near the project site; the only existing problem is dust emissions during dry and windy conditions due to soil dispersion.

Water There is no surface fresh water source within the vicinity of the project site except the rivers feeding the Tuz Golu, about 40 km. north of the site.

Soil General properties of the soil in the area, distributions of soil groups, land use conditions, slope and erosion degrees were examined. There are limited agricultural activities in the area.

Noise Results of ambient noise measurements settlements close to the project site are typical for rural areas.

Flora and Fauna Endemic and/or rare species were identified in the general region of the Tuz Golu Basin[23] (but not specifically in the salt lake or the discharge area) including species under protection by Bern Convention. For each species under protection, requirements of the particular laws, regulations and treaties have been reviewed and all specifications will be followed during construction and operation.

Wetlands in the vicinity of the brine discharge pipeline and Tuz Golu are important as a "migratory bird route". This area is designated as a "Special Environmental Protection Area". About 15 km of brine discharge pipeline route passes through this zone. However, important bird species do not live there. They may be found individually or in small colonies as part of their migration pattern. To minimize any effect to migratory birds, construction of the 15 km section of brine discharge pipeline will be restricted to the period of lowest or no migration activity (July-September).

The Hirfanli dam section that is the fresh water intake is on the border of a bird wintering area (Tufted duck, Pochard, Red-crested Pochard, White-headed duck, Coot and water birds) and migratory route (Ruddy shell duck). Construction of this section will be carried out between July and August to minimize any effects on migratory and wintering birds and their habitats.

[23] The Tuz Golu Basin covers the salt lake itself, rivers feeding the lake and other related lakes. Exact borders are not clear, but the basin area is estimated at around 530,000 hectare.

Tuz Golu Basin

Tuz Golu Basin is the water catchment area covering the lake itself, rivers feeding the lake and other related lakes. Although exact borders are not certain, the basin area is around 530,000 hectare. No fish species were found in close vicinity of the project site. Fresh water creeks that feed the salt lake generally cannot reach the lake in summer months. Thus, with no source of fresh water during the summer, the resulting lake salinity from net evaporation provides an extremely hostile environment for fish habitat, as well as being extremely inhospitable to any plant growth throughout the year.

Three main fresh water rivers namely Karasu, Pecenek and Insuyu feed the lakes in the basin. Fish species mentioned in the EIA Report were not observed during field surveys carried out on April 2001. However based on the literature, these species are possibly found in Insuyu River, at approximately 100 km north of the project site (Phoxinellus crassus found in 1960 and Aphanius chandrei found in 1944). The high salinity in the lake basin (including the discharge area) prevent these species from migrating to these sites.

In conclusion, the proposed project site (including surface facilities and brine discharge area) is poorly inhabited and poorly vegetated with any significant flora and fauna.

Environmental Impacts

The EIA identified a number of potential impacts associated with both construction and operation phases of the project.

All pipelines will be buried. Therefore key potential impacts are construction of the fresh water pipeline, brine discharge line, and natural gas connector line. There are also potential impacts associated with construction of surface facilities for gas processing, drilling operations and leaching operations.

Operation activities are limited to gas injection and withdrawal so few potential operational impacts are identified. Major concerns are related to safety risks for workers and populations at the storage site and along the gas pipeline route.

Potential project impact mitigation and monitoring plans are outlined in Tables 11.2 and 11.3 respectively.

All potential impacts have been analyzed and are readily managed through internationally accepted standards of good engineering practices and procedures which will be followed in design, construction and operation of the gas storage and pipeline distribution systems for water, leachate and gas respectively. Potential impacts associated with the brine discharge into Tuz Golu have been determined to be insignificant, since the effluent will be providing water to Tuz Golu in the same manner and of the same quality as is naturally supplied from groundwater sources currently feeding the lake. The Environmental Management Plan (EMP) includes cost effective mitigation measures for each identified potential impact, details of the implementation period, monitoring requirements and institutional arrangements for effective environmental management. Reference should be made to the EMP for further details.

Table 11.2 Mitigation Plan

	Issue	Mitigating Measure
Construction of pipeline and surface facilities Water Supply Brine Discharge Natural Gas Branch Line	Excavation	• Excavation material will be reused • The vegetative topsoil will be stored properly
	Dust generation due to excavation, material storage, handling and transport	• Excavated material will be protected from wind and rain • All transportation vehicles will be covered • The speed of the vehicles will restricted • Any exposed dust prone areas (e.g. roads) will be watered regularly
	Solid waste generation at worksite	• Domestic solid wastes and construction wastes will be collected and disposed properly
	Wastewater generation at worksite	• Domestic wastewater will be collected in a septic tank. • Various wash down waters will be collected separately and used for watering green areas. • Any hydro test water will be discharged after settling. • Waste/residual oils will be stored onsite and given to a firm licensed by MoEF.
	Noise and vibration due to site preparation and construction activities	• No explosives to be used unless required. Local residents will be informed. • The activities that generate noise will be limited. • Employees will be provided with noise protection. • Maximum noise levels will not be exceeded
	Transportation	• No access roads will be constructed unless necessary and approved by BOTAŞ. The existing roads will be used to the greatest extent.
	Impacts on flora (due to site clearance)	• Species protected by the BERN Convention and "Vulnerable" species according to Turkish Red Data Book if found, will be managed in accordance with the Bern Convention.. • Construction activities will be limited to the construction corridor.
	Impacts on fauna (disturbance during the construction activities)	• Decisions of Central Hunting Commission shall be complied with. *(refer to the Annex)* • Construction activities will be limited to the construction corridor. • Any rare and endangered species will be managed in accordance with the national or international regulations and treaty requirements • Construction activities will take place during periods when no migratory bird flight are occurring • A fauna expert shall be employed by the Construction Contractor to monitor construction activities
	Health and safety risks	• Warning signs will be placed in the field. • The workers will be equipped with necessary safety equipments. • The area will be fenced and guarded or locked. • An emergency response plan will be developed.
	Handling & usage of explosive/hazardous and toxic materials	• Any explosive material will locked. • Any fuels or hazardous liquids will be stored in tanks situated on impermeable (e.g. concrete) surfaces with bund to contain any leaks. • Warning signs will be placed on the storage tanks, etc.
	Drainage (for surface facilities)	• The drainage system will be formed at the base level of the buildings.
	Impacts on Cultural and Natural Assets	• A cultural expert will monitor the construction activities. • Turkish chance find procedures will be followed.
Drilling activities	Oily Waste Waters	• A wastewater pool with an impermeable lining and an oil trap will be placed in the channel.
	Impacts on Groundwater due to leakage of drilling mud fluids	• Casing will be cemented until reaching the impermeable formation along the drilling section. • Only water based drilling muds with no toxic materials will be used.

Table 11.2 Mitigation Plan		
	Issue	**Mitigating Measure**
	Formation Wastes and Drilling Muds	• Mud pits (lined) will be opened for the temporary storage of the formation wastes and drilling mud and they will be removed from the area by a firm licensed by MoEF after solidification (drying).
Leaching operations	Sludge from brine settling tanks	• The solid particles will be-collected in settling tanks
	Impacts of brine discharge on lake water quality	• Discharge location is in unproductive/arid area in terms of ecological characteristics and agricultural activities and also there exist no salt production) of Lake (based on the official maps and field surveys) • Discharge plume will remain within the boundaries of the unproductive area. The plume will be monitored. •
Operation	Noise (Pump and Compressors, etc.)	• Installation of silencers. • Low sound emanating backup motor, pump and compressors • Limitation of truck transportation hours
	Fire	• A fire protection system will be available at site.
	Accidents and Sabotage	• Pressure, temperature and flow rate will be monitored continuously • Line valves sensitive to sudden pressure drops will shut down automatically.
	Health and Safety	• Education on; • Site security • Environmental protection • First aid • Fire fighting • Health and occupational safety • Risk assessment • will be given to the personnel employed.
	Leakage and explosion (pipeline)	• In case of leakage of natural gas in closed areas the area will be immediately ventilated
	Emergency Cases	• BOTAŞ, will inform the relevant governorships, municipalities, etc. prior to the commencement of gas storage and send to them the emergency response plans
	Waste generation	• Domestic solid wastes will be collected and properly disposed. • Septic tank will be replaced by package treatment plant. Effluent will be used for watering green areas

Table 11.3 Monitoring Plan				
	Parameters to be monitored	**Monitoring Location**	**Monitoring Technique**	**Monitoring Frequency**
Construction of Pipeline and Surface Facilities	Top soil storage	Top soil storage area	Visual	Weekly
	Storage and Disposal of excavated material	Designated disposal areas	Visual	Weekly
	Covering of vehicles, which carry excavation material	Work site boundaries at the location, where loading will be performed.	Visual	At random, but averaging weekly
	Dust Level	Excavation, material storage, handling areas	Visual	Weekly during construction activities. More frequently (2-3 times/week) during hot, dry, windy conditions
	Solid Waste (Collection, storage and disposal)	Work site boundaries (at the solid waste storage area)	Visual	Initially once a week, if satisfactory subsequently monthly
	Domestic wastewater management Septic tank lined	Septic tank	Visually for leaks (Sudden decrease in the level)	Weekly
	Washing waters management Suspended solids (ss), oil and grease	At the exit of the washing water treatment area (for ss, oil grease removal)	• Gravimetric analysis for ss • Hexane solubility test for oil and grease	Weekly initially then monthly
	Hydro test water disposal (either settled before discharge for suspended solids and any coarse material removal)	At the hydro test water collection tank prior to discharge	Visual (not necessary to make physical/chemical analysis)	Before discharge
	Waste/residual oils collection and removal	Waste oil containers	Visual	Once a week
	Noise level dB[A]	Along the pipeline route and surface facilities construction areas	Sound level meter	During major construction activities and if there are local complaints
	Health and Safety • Use of equipment by employees against noise • Warning signs • Safety equipments of workers • Adoption of safety rules (for security of site and excavation, scaffold and heavy vehicles, etc)	Work site boundary Before entering workplace	Visual	Random, but averaging once/week. If violations are observed, frequency will be increased
	Work site safety (either fenced and entrance & exit are kept under control)	Work site boundary	Visual	Random, but averaging once/week. If violations are observed, frequency will be increased
	Drainage of surface facilities area and impermeability of internal roads	Facilities area	Visual	During site preparation and construction of facilities (Check during rainy conditions)
	Flora under protection	Along the pipeline route and at the surface facilities area	Visual monitoring, recording and reporting by university trained ecological expert	Weekly during construction activities (more frequent if necessary)

Table 11.3 Monitoring Plan				
	Parameters to be monitored	**Monitoring Location**	**Monitoring Technique**	**Monitoring Frequency**
	Fauna under protection and the construction periods for wintering and migratory birds	Along the pipeline route and at the surface facilities area	Visual monitoring, recording and reporting by university trained ecological expert	Weekly during construction activities (if necessary, then more frequent, to be decided by BOTAŞ)
Drilling Activities	Oily wastewaters collection and storage	Wastewater pool (either lined and oil trap functioning properly)	Visual	Weekly or daily if problems are observed
	Removal of oily wastewater by Licensed Companies	Plant site	Visual	According to removal schedule to be determined prior to the construction activity
	Casing usage against leakage of drilling mud	Drilling area	Pressure monitoring of the drilling casing to see if there is a rapid decrease	Continuously, during drilling activity
	Formation wastes and drilling muds storage and removal	Mud pits for leakage Controlled entrance to mud pit area Disposal by licensed firm	Visual Check certification. Check validity of license before engaging the firm	Weekly
Leaching Operations	Brine quality/Receiving water quality (salt content, pH, heavy metals,)	At diffuser location Tuz Gölü (brine discharge) Measurements to be made upstream and downstream of diffuser as well as on either side. Attempts will be made to characterize the brine discharge "plume" and how/if it is evolving with time compared to predictions to ensure it remains in the unproductive area	Conductivity meter, pH meter Atomic absorption -key parameters – compare to receiving water in unproductive area	Monthly
Operation	Noise from Compressor Stations	• Compressor Station at the project sites • At the nearest settlement area	Sound level meter	Measurement at the start of operation, and then any complaints from local residents
	Domestic Wastewater	Wastewater treatment plant effluent	pH, BOD, suspended solids	Weekly then monthly if operation is stable
	Fire protection system	At surface facilities area	Visual and regularly scheduled simulations	Monthly initially, quarterly if no problems observed
	Leakage and explosion	Gas storage area, surface facilities	Methane detectors	Continuous

Public Consultation

The first public consultation was performed on 27.03.2003 at Sultanhani Municipality with the participation of local people and governmental organizations. The second public consultation was performed on 24.03.2005 at Ağaçören and Sultanhani Municipalities. Details of the first Public Consultation are fully documented in EIA Report. Records of both first and second public consultations are included in the EMP.

During the first public consultation concerns were raised about groundwater usage for leaching operations, since there is a water shortage and this might impact irrigation, seismicity of the area, and brine discharge impacts on Tuz Golu.

These issues were fully addressed in EIA Report. In addition, public concerns played an important role in BOTAŞ' revising their decision on water resource selection. Taking public concerns into consideration, BOTAŞ altered the project design to utilize Hirfanlı Dam reservoir as fresh water resource.

During the second public consultation, major concerns were duration of construction activities and job opportunities for local people. BOTAŞ representatives stated that local manpower would be preferred during construction activities. Local people were also informed that their agricultural activities would not be negatively affected.

C. Institutional Arrangements

Organizational Overview

In order to provide efficient co-ordination between,

- BOTAŞ,
- Construction Contractor,
- Independent Environmental Monitoring Company to be hired by BOTAŞ,
- Ministry of Environment & Forestry (MoEF) MoEF, EIA Monitoring and Control Department and its associated units.

With reference to the Environmental Management Plan (EMP), monitoring and control are of critical importance for minimizing environmental impacts.

BOTAŞ Management together with the construction department will ensure that all construction related activities of Contractor(s) comply with approved EMP. To achieve this, BOTAŞ will regularly monitor and evaluate the Contractor's field activities and performance through auditors.

Environmental Engineer of BOTAŞ directly connected to Underground Storage Manager, will be responsible for coordinating and supervising the monitoring activities. BOTAŞ will also carry

out an independent auditing programme through an Environmental Monitoring Company, which will inspect the field activities of Contractor(s) and directly report to BOTAŞ.

Roles and Responsibilities

BOTAŞ Contractor(s) will be responsible for adopting the EMP during construction, implementation of all mitigation measures stated in EMP and required to be in compliance with the EMP together with the project' environmental standards. In order to achieve this, BOTAŞ Contractor(s) will adopt a self-control/monitoring mechanism and formulate his own management plan including regular self inspection and auditing programme, which will be reviewed in terms of consistency with EMP and approved by BOTAŞ prior to construction. BOTAŞ Contractor(s) will assign a full time "Environmental Engineer", prepare weekly progress reports based on the monitoring plan detailing works completed within the respective period, results of measurements and supervisions further to site problems encountered and have direct contact with BOTAŞ Environmental Engineer. Progress reports will include a work schedule for the next period.

BOTAŞ will hire an "Environmental Monitoring Company" for independent monitoring the BOTAŞ Contractor(s) activity. The Environmental Monitoring Company will review and comment on the weekly reports prepared by the Contractor(s), inspect work sites, review project environmental performance and Contractor(s) field activities, implement environmental control analyses and data collection as defined in the EMP, and report their findings both to the Contractor's Environmental Engineer and BOTAŞ Environmental Engineer on a weekly basis. Reports would detail an environmental problems encountered, deficiencies in protection measures, and recommendations. Responsibility for resolving any reported problems and remedying reported deficiencies resides with the Contractor(s) with possible approval by BOTAŞ if either the construction schedule is affected or expenditures are necessary to implement the recommendations. The Environmental Monitoring Company should integrate into these studies the findings of their site visits and their proposed solutions for any environmental bottlenecks.

Weekly and Monthly reports by Environmental Monitoring Company will be provided to BOTAŞ for review and approval of BOTAŞ Environmental Engineer who will evaluate data collected and analyses, perform verification visits during construction and operation activities incase needed, and prepare a final report including summary of the activities and recommended actions, if necessary on a monthly basis, which needs to be reviewed and approved by the UGS Manager. In case of significant action is required, BOTAŞ Management will be informed.

At the project site, daily meetings initially (but the frequency may be changed by BOTAŞ, depending on the work progress) with the participation of Environmental Monitoring Company's, Contractor's and BOTAŞ's site supervisors, to discuss the daily activities, and take decisions. With BOTAŞ authorization and approval, the Contractor(s) will be responsible for adoption of the decisions and to perform the required actions.

Compliance and non-compliance with EMP identified during inspection and audits will be recorded by Environmental Monitoring Company and reported to BOTAŞ immediately. BOTAŞ

Management will take necessary actions in such a case to stop the activities in the case of Contractor's non-compliance with EMP and take corrective action.

BOTAŞ will submit Summary Reports to World Bank quarterly indicating activities and actions taken, as well as project progress.

Monitoring process should involve the contribution of the MoEF. The Independent Environmental Monitoring Company will also report to the MoEF periodically during the construction activities in a requested time schedule and format.

During operation the unit in BOTAŞ responsible for operation will be responsible for monitoring and reporting. BOTAŞ, at that stage, will either continue working with the Environmental Monitoring Company, which performed monitoring during construction, or hire another company for making measurements defined in the operation phase of the monitoring plan and reporting results to BOTAŞ. The environmental engineer of the department responsible for the project operation will review and evaluate these results and prepare quarterly reports including any recommended actions to BOTAŞ Management.

III. DAM SAFETY

The Hirfanli dam was constructed between 1954 and 1960. It is an inclined clay core rockfill dam with a selected material transition area downstream on a thin inclined core. Filters are provided between the watertight zones (inclined core and transition) and the downstream rockfill shell. Maximum dam height on its foundations is 82 m. Reservoir capacity at maximum storage level (851 m a.s.l.) is 5.75 billion m^3. Dam foundations are in an igneous rock formation (gabbro) generally sound to locally weathered. A grouting curtain has been provided at the base of the inclined clay core.

The following agreements were reached with DSI, EUAS and BOTAŞ after a site visit on June 28, 2005. (The DSI report of April 28, 2005 is attached below.)

Dam Stability

In analyzing dam stability the Designer (re: June 1958 Analysis of Design, Knappen-Tippets-Abbett-McCarthy) assumed a fully drained downstream shell and derived the corresponding factor of safety under an "infinite slope" assumption. This assumption is acceptable for a free draining rockfill used at Hirfanli. At the same time, it is normal practice to introduce monitoring measures for validating such assumption during reservoir operation. The validation involves monitoring the location of the saturation line within the dam body and in the downstream shell in particular. This has not been the case at Hirfanli.

Similar dams have experience progressive migration of fine materials with consequent reduction of permeability of the rockfill. This is turn may lead to raising of the saturation line in the downstream shell and reduction of the factor of safety. In order to verify that this is not the case at Hirfanli, geophysical methods could be used and/ or recourse could be made to the installation of open-tube type piezometers in the downstream shell. Given the observed situation, the latter

option is not recommended before a geophysical campaign has provided relevant indications. DSI has considerable experience in site investigations, including geophysical methods, and DSI experts agreed to assess which are the preferred methods[24] for the task and to carry out the tests. Once the location, or the absence, of a saturation zone has been ascertained, the tests could be repeated at, say, 3 or 5 years intervals if other observations (see below) do not suggest otherwise.

Seepage Control

Probably, the most critical mode of deterioration that should be kept under control is internal erosion of the core and filter materials. Inspection of the downstream toe of the dam revealed that no drainage collection system (drainage ditch, drainage conduit outfalls, etc.) is in place. Besides, the area seems quite dry as also suggested by the fact that the small platform at the toe of the dam is irrigated in order to maintain it green. However, the toe is composed of large boulders and there is dense vegetation that makes inspection almost impossible.

Given the situation, the low vegetation (excluding trees) should be removed by EUAS and access to the entire downstream toe provided for visual inspection. Observations should be carried out during the period of maximum reservoir level with the intent of locating areas of concentrated seepage (if any) by DSI. Should these be observed, adequate monitoring devices would be installed and used to regularly monitor quantity (discharge) and quality (contents of sediments) of the water.

Global Movements

The design drawings (details A and B- plate No.11) show the existence of embankment external settlement points. One such point was observed during the visit, on the crest of the dam. Such measuring points should be cleared of debris and re-activated by EUAS for measuring global deformations of the embankment. One reference set of measurements should be carried out as soon as possible by DSI, and repeated with yearly intervals for the first 3 years. After that, DSI experts would decide on the most appropriate frequency.

Spillway

Hirfanli dam has got a free crest spillway. An unlined channel connects the control weir to the reservoir. The discharge channel downstream of the control weir is excavated in rock and has no lining. The spillway has been designed to evacuate floods with a 1:1000 year return period. In 45 years of operation, the spillway has been discharging only during two years: 1968 and 1988. The upstream channel and the spillway crest are clogged with vegetation that considerably reduces the hydraulic performance of the spillway system. The downstream channel is blocked by several rockfalls that partially obstruct the waterway. Both situations need to be rapidly addressed by EUAS.

45 years of flow data are available in addition to those used at the design stage. It is highly recommended that the design flood, for different return periods, including the PMF (Probable Maximum Flood), is updated using all available data. The study should include a Safety-Check Flood analysis[25]. DSI agreed to carry out these analyses.

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[24] Resistivity, Ground Penetrating Radar, Natural Potential, Thermal methods, etc.

[25] The **safety check flood** is often made equal to the Probable Maximum Flood (PMF) or the 1:10,000 years flood. It is considered acceptable practice for the crest structure, waterway, and energy dissipation to be on the verge of

Dam Design
Copy of the Design reports and Drawings should be available at the dam site and the operators should be familiar with them. EUAS will update the Operation and Maintenance Manual for the dam and train dam operators in its application. DSI can assist in this task.

Emergency Preparedness
Telecommunications systems are available and functional. Staff is aware of the line of communication to be used in case of emergency situations (floods, earthquakes, etc.). The Howell-Bunger valve that controls the bottom outlet is operated every year to make sure that it will be functional in case rapid drawdown of the reservoir is required.

Supervision and Independent Inspections
Independent inspections should be continued by DSI experts on a regular basis, as per current practice in Turkey.

The dam safety monitoring protocol is disclosed in the EMP as an annex.

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failure, but to exhibit marginally safe performance characteristics for this flood condition. The **design flood** strictly represents the inflow which must be discharged under normal conditions with a safety margin provided by the freeboard. It is usually taken as a percentage of PMF or a flood with a given probability of excedence.

Attachment

DSI Site Visit Report, April 28, 2005
(English Translation)

Subject: Security Status of the Hirfanlı Dam
Date: April 28, 2005

Team Members:

Abdüllatif LATİFOĞLU, Branch Director (DSİ Dams and Hydro Power Plants Dept.)
Seyit AKSU, Civil Engineer (DSİ Operation and maintenance Dept.)
Tümer MANGIR, Branch Director (DSİ 5th Region)
Ali ÖZDEN, Branch Director (DSİ 5th Region)
Hasan ÇAKIRYILMAZ, Branch Director (DSİ 5th Region)
Şerafettin CANAZ, Civil Engineer (DSİ 5th Region)
Nafiz ÖZCAN, EÜAŞ Hirfanlı and Environs Operation Director

The above team conducted studies on the said day to specify the latest status of the Hirfanlı Dam, from which BOTAŞ General Directorate plans to take 10 million cubic meters of water annually under the "Tuz Gölü Underground Natural gas Storage Project". The findings of the team are as follows:

Characteristics of the Dam

River: Kızılırmak
Province: Kırşehir
Embankment Type: Rockfill
Dam Volume: 2,000,000 m^3
Crest Level: 860
Height from Foundation: 83 m
Height from Thalweg: 78
Normal Water Level: 851
Reservoir Volume: 5980 hm^3
Reservoir Area: 263.00 km^2
Purpose: Energy and Flood Prevention
Irrigation Area: --
Installed Power Capacity: 128 MW
Annual Generation: 400 GWh
Construction started in 1953
Construction completed in 1959

- The dam does not have any measurement facility since its project design does not cover any measurement facility

- There has not been any disruption in the geometry of the dam's upstream and downstream slopes despite the slope of 1.3/1.
- There is no leakage, dampening or steaming on the dam's downstream slope and slope intersection line.
- No cracking (lengthwise or widthwise) has been observed on the crest of the dam. It is considered that the dam has completed its settling.
- The research gallery between the body of the dam and the power plant building has been analyzed and no water movement has been detected.
- It is important to urgently remove the plants and trees, together with their roots, on the dam's downstream slope and the body of the dam, in terms of security.
- At this stage, it is not necessary to install measurement devices at the dam. If future observations reveal any negative aspect, then specifically needed measurement devices may be planned and installed.
- If the posts on the dam will be re-arranged and their upper parts are turned into benchmark points, it will be possible to observe the dam movements through geodesic measurements (in x, y, z directions).
- The dam is examined every year by an Examination Team consisting of expert staff and the recommended repair-maintenance activities are performed within the same year. The photos taken are annexed to the report.

Conclusion: The studies have not revealed any finding that would negatively affect the security of the dam.

Tümer MANGIR, Branch Director (DSİ 5th Region)

Şerafettin CANAZ, Civil Engineer (DSİ 5th Region)

Hasan ÇAKIRYILMAZ, Branch Director (DSİ 5th Region)

Ali ÖZDEN, Branch Director (DSİ 5th Region)

Seyit AKSU, Civil Engineer (DSİ Operation and maintenance Dept.)

Abdüllatif LATİFOĞLU, Branch Director (DSİ Dams and Hydro Power Plants Dept.)

Annex 12: Project Preparation and Supervision

TURKEY: GAS SECTOR DEVELOPMENT

	Planned	Actual
PCN review	03/11/2005	03/03/2005
Initial PID to PIC	03/25/2005	03/31/2005
Initial ISDS to PIC	3/25/2005	07/12/2005
Appraisal	04/04/2005	05/04/2005
Negotiations	10/11/2005	10/11/2005
Board/RVP approval	11/29/2005	
Planned date of effectiveness	02/28/2006	
Planned date of mid-term review	06/30/2009	
Planned closing date	12/31/2012	

Key institutions responsible for preparation of the project:

BOTAŞ

Bank staff and consultants who worked on the project included:

Name	Title	Unit
Ranjit Lamech	Task Team Leader	ECSIE
Sameer Shukla	Senior Energy Specialist	ECSIE
James Moose	Economist	ECSIE
Gurhan Ozdora	Senior Operations Officer	ECSPF
Bernard Baratz	Environment Specialist	ECSIE
Norval Stanley Peabody	Lead Social Scientist	ECSSD
Salih Kemal Kalyoncu	Procurement Specialist	ECSPS
Devesh Chandra Mishra	Senior Procurement Specialist	ECSPS
Dilek Barlas	Senior Counsel	LEGEC
Shinya Nishimura	Financial Analyst	ECSIE
Yukari Tsuchiya	Program Assistant	ECSIE
Ozlem Katisoz	Team Assistant	ECUU6
Alessandro Palmieri	Lead Dam Specialist	QACU
Ayse Seda Aroyomak	Sr. Financial Mgt Specialist	ECSPS
Hala Khattar	Senior Financial Officer	BCFBD
Ray Tomkins	Consultant	Economic Consulting Assoc.
Nafi Toksoz	Consultant	Mass. Instt. Of Technology (MIT)
Kenneth Beckman	Consultant	International Gas Consulting Inc.

Bank funds expended to date on project preparation:

1. Bank resources:
2. Trust funds:
3. Total:

Estimated Approval and Supervision costs:

1. Remaining costs to approval:
2. Estimated annual supervision cost:

Annex 13: Documents in the Project File

TURKEY: GAS SECTOR DEVELOPMENT

- Turkey: Economic Assessment and Regulatory Issues for the Tuz Golu Storage Project, Economic Consulting Associates Ltd (July 2005)
- Land Acquisition Plan (August 2005)
- Environmental Impact Assessment (EIA) (June 2005)
- Report on Technical Assessment of the Tuz Golu Storage Project, International Gas Consulting Inc. (July 2005)
- Tuz Golu Underground Gas Storage Facility – Finite Element Analysis, K. Fuenkajorn, Geomechanics Research Unit, Suranaree University of Technology, Thailand (May 2005)
- Seismic Hazard Evaluation of the Tuz Golu Gas Storage Facility in Turkey, Dr. Nafi Toksoz, Earth Resources Laboratory, Massachusetts Institute of Technology (June 2005)
- Feasibility Report for the Tuz Golu Gas Storage Project, BOTAŞ (June 2005)
- Gas Sector Strategy Note, TheWorld Bank (September 2005)
- Final Design of Sub-surface Facilities, E.ON Engineering (August 2005)

Annex 14: Statement of Loans and Credits

TURKEY: GAS SECTOR DEVELOPMENT

			Original Amount in US$ Millions						Difference between expected and actual disbursements	
Project ID	FY	Purpose	IBRD	IDA	SF	GEF	Cancel.	Undisb.	Orig.	Frm. Rev'd
P066149	2005	SEC EDUC	104.00	0.00	0.00	0.00	0.00	96.49	0.00	0.00
P077328	2005	RAIL RESTRUCT	184.70	0.00	0.00	0.00	0.00	173.32	0.00	0.00
P078359	2005	SEISMIC RISK MITIGATION	400.00	0.00	0.00	0.00	0.00	373.91	0.00	0.00
P081880	2005	MUNICIPAL SERVICES	275.00	0.00	0.00	0.00	0.00	256.79	0.00	0.00
P093568	2005	EFIL 3 (CRL)	305.00	0.00	0.00	0.00	0.00	298.04	0.00	0.00
P094167	2005	PSSP 2	465.40	0.00	0.00	0.00	0.00	434.21	0.00	0.00
P094176	2005	ECSEE APL #2 (TURKEY) (CRL)	66.00	0.00	0.00	0.00	0.00	61.03	0.00	0.00
P082801	2004	EFIL 2	303.10	0.00	0.00	0.00	0.00	75.00	-155.10	0.00
P082996	2004	PFPSAL 3	1,000.00	0.00	0.00	0.00	0.00	500.00	0.00	0.00
P075094	2004	WATERSHED REHAB (GEF)	0.00	0.00	0.00	7.00	0.00	6.75	0.25	0.00
P074053	2004	HEALTH TRANSIT (APL #1)	60.61	0.00	0.00	0.00	0.30	56.34	7.22	0.00
P070950	2004	ANATOLIA WATERSHED REHAB	20.00	0.00	0.00	0.00	0.10	19.55	0.15	0.00
P072480	2004	RENEW ENERGY	202.03	0.00	0.00	0.00	1.01	196.33	7.31	0.00
P059872	2003	BASIC ED 2 (APL #2)	300.00	0.00	0.00	0.00	0.00	291.46	283.05	80.46
P074408	2002	SRMP	500.00	0.00	0.00	0.00	0.00	223.31	187.94	-13.89
P070286	2002	ARIP	600.00	0.00	0.00	0.00	0.00	268.71	268.71	66.01
P069894	2001	PRIV SOC SUPPRT	250.00	0.00	0.00	0.00	0.00	7.21	7.21	-28.79
P068368	2000	MARMARA EARTHQUAKE EMG RECON	505.00	0.00	0.00	0.00	0.00	281.59	281.59	37.37
P044175	2000	BIODIV/NTRL RES MGMT (GEF)	0.00	0.00	0.00	8.19	0.00	4.12	3.52	0.18
P009073	1999	INDUSTRIAL TECH	155.00	0.00	0.00	0.00	0.00	13.49	13.49	0.00
P048852	1998	NAT'L TRNSM GRID	270.00	0.00	0.00	0.00	34.48	116.60	151.08	78.76
		Total:	5,965.84	0.00	0.00	15.19	35.89	3,754.25	1,056.42	220.10

TURKEY
STATEMENT OF IFC's
Held and Disbursed Portfolio
In Millions of US Dollars

		Committed				Disbursed			
		IFC				IFC			
FY Approval	Company	Loan	Equity	Quasi	Partic.	Loan	Equity	Quasi	Partic.
2005	Acibadem	20.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
	Alternatif Bank	0.50	0.00	0.00	0.00	0.50	0.00	0.00	0.00
1996/01/03/05	Arcelik	103.36	0.00	0.00	103.36	103.36	0.00	0.00	103.36
2000	Arcelik LG Klima	8.29	0.00	0.00	0.00	8.29	0.00	0.00	0.00
2002	Assan	22.50	0.00	0.00	0.00	22.50	0.00	0.00	0.00
2002	Atilim	6.50	0.00	0.00	0.00	6.50	0.00	0.00	0.00
2000	Banvit	8.33	5.00	0.00	0.00	8.33	5.00	0.00	0.00
	Bayindirbank A.S	1.50	0.00	0.00	0.00	1.50	0.00	0.00	0.00
2002	Beko	32.75	0.00	0.00	28.07	32.75	0.00	0.00	28.07
2001	Bilgi	8.00	0.00	0.00	0.00	8.00	0.00	0.00	0.00
1994/96/97	Borcelik	8.18	3.21	0.00	0.00	8.18	3.21	0.00	0.00
2004	Borusan Holding	30.00	0.00	10.00	0.00	30.00	0.00	10.00	0.00
1994	CBS Holding	3.50	0.00	0.00	0.00	3.50	0.00	0.00	0.00
1990/02	Conrad	3.15	0.00	0.00	0.00	3.15	0.00	0.00	0.00
2002	EKS	10.96	0.00	0.00	0.00	10.96	0.00	0.00	0.00
2004	Ege	10.00	0.00	0.00	8.00	10.00	0.00	0.00	8.00
1995	Entek	19.00	0.00	0.00	9.94	19.00	0.00	0.00	9.94
1999	Finansbank	2.22	0.00	0.00	0.00	2.22	0.00	0.00	0.00
2004	Garanti Leasing	10.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00
1999	Gumussuyu Kap	4.00	0.00	3.66	0.00	4.00	0.00	3.66	0.00
2001	Gunkol	4.53	0.00	0.31	0.00	4.53	0.00	0.31	0.00
1998	Indorama Iplik	4.38	0.00	0.00	0.00	4.38	0.00	0.00	0.00
2005	Intercity	15.00	5.00	0.00	27.75	4.44	5.00	0.00	8.21
1998/00/02	Ipek Paper	10.85	0.00	0.00	0.00	10.85	0.00	0.00	0.00
1990	Kepez Elektrik	2.43	0.00	0.00	0.00	2.43	0.00	0.00	0.00
1988/90	Kiris	11.33	0.00	0.00	0.00	11.33	0.00	0.00	0.00
2004	Koclease	30.00	0.00	0.00	0.00	30.00	0.00	0.00	0.00
1991	Kula	5.20	0.00	0.00	0.00	5.20	0.00	0.00	0.00
2003	MESA Group	11.00	0.00	0.00	0.00	11.00	0.00	0.00	0.00
2004	Meteksan Sistem	0.00	0.00	8.50	0.00	0.00	0.00	8.50	0.00
2002	Milli Re	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1998/02	Modern Karton	8.33	0.00	0.00	0.00	8.33	0.00	0.00	0.00
1991	NASCO	10.18	0.00	0.00	3.55	10.18	0.00	0.00	3.55
2004	OPET	25.00	0.00	0.00	40.00	8.33	0.00	0.00	25.00
2004	Oyak Bank	50.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00
2002	Pasabahce	3.75	0.00	0.00	0.00	3.75	0.00	0.00	0.00
1998	Pinar ET	3.14	0.00	0.00	0.00	3.14	0.00	0.00	0.00

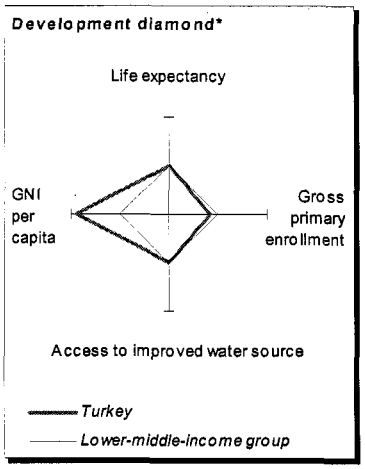
2000	Pinar SUT	11.45	0.00	0.00	0.00	7.77	0.00	0.00	0.00
1999	SAKoSa	9.91	0.00	6.61	6.64	9.91	0.00	6.61	6.64
1990	Silkar Turizm	1.89	0.00	0.00	2.15	1.89	0.00	0.00	2.15
2002/03	Sise ve Cam	43.93	0.00	18.18	36.56	43.93	0.00	18.18	36.56
2002	Soktas	2.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00
2005	TSKB	0.00	0.00	50.00	0.00	0.00	0.00	50.00	0.00
1982/83/89/91/96/99	Trakya Cam	0.00	0.36	0.00	0.00	0.00	0.36	0.00	0.00
2002	Turk Ekon Bank	11.11	0.00	15.00	0.00	11.11	0.00	15.00	0.00
2001	Turkish PEF	0.00	9.59	0.00	0.00	0.00	2.17	0.00	0.00
1999	Unye Cement	8.22	0.00	0.00	0.00	8.22	0.00	0.00	0.00
1999	Uzel	8.40	0.00	0.00	4.95	8.40	0.00	0.00	4.95
1998	Viking	7.62	0.00	0.00	0.00	7.62	0.00	0.00	0.00
	Total portfolio:	662.39	23.16	112.26	270.97	571.48	15.74	112.26	236.43

		Approvals Pending Commitment			
FY Approval	Company	Loan	Equity	Quasi	Partic.
2001	Akbank	0.03	0.00	0.00	0.00
2004	Akbank BLoan Inc	0.00	0.00	0.00	0.02
2005	Avea	0.12	0.00	0.00	0.30
2005	Bandirma Dogalga	0.00	0.00	0.00	0.00
2005	Gemlik Dogalgaz	0.00	0.00	0.00	0.00
2002	Milli Reasurans	0.00	0.01	0.00	0.00
2005	PALEN	0.00	0.00	0.00	0.00
2005	Palgaz	0.01	0.00	0.00	0.00
2005	Sivas Dogalgaz	0.00	0.00	0.00	0.00
2002	TEB III	0.00	0.00	0.00	0.05
2005	YUCE	0.00	0.00	0.00	0.00
	Total pending commitment:	0.16	0.01	0.00	0.37

Annex 15: Country at a Glance

TURKEY: GAS SECTOR DEVELOPMENT

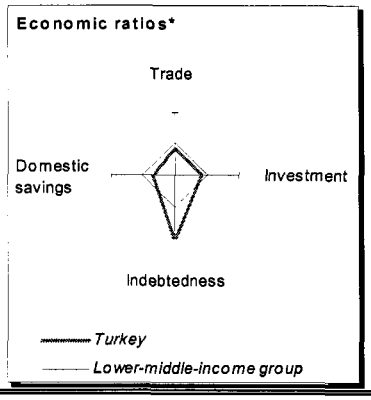
POVERTY and SOCIAL	Turkey	Europe & Central Asia	Lower-middle-income
2003			
Population, mid-year *(millions)*	70.7	473	2,655
GNI per capita *(Atlas method, US$)*	2,800	2,570	1,480
GNI *(Atlas method, US$ billions)*	197.8	1,217	3,934
Average annual growth, 1997-03			
Population *(%)*	1.7	0.0	0.9
Labor force *(%)*	2.3	0.2	1.2
Most recent estimate (latest year available, 1997-03)			
Poverty *(% of population below national poverty line)*	..	..	..
Urban population *(% of total population)*	66	63	50
Life expectancy at birth *(years)*	70	69	69
Infant mortality *(per 1,000 live births)*	35	31	32
Child malnutrition *(% of children under 5)*	8	..	11
Access to an improved water source *(% of population)*	82	91	81
Illiteracy *(% of population age 15+)*	14	3	10
Gross primary enrollment *(% of school-age population)*	94	103	112
Male	98	104	113
Female	91	102	111



KEY ECONOMIC RATIOS and LONG-TERM TRENDS

	1983	1993	2002	2003
GDP *(US$ billions)*	61.5	179.4	183.9	240.4
Gross domestic investment/GDP	16.3	27.6	21.3	22.8
Exports of goods and services/GDP	12.5	13.7	29.2	27.4
Gross domestic savings/GDP	12.2	21.9	19.8	19.5
Gross national savings/GDP	15.3	24.8	20.8	19.5
Current account balance/GDP	-3.1	-3.6	-0.8	-2.8
Interest payments/GDP	2.9	2.2	3.8	3.2
Total debt/GDP	33.0	38.2	71.3	61.2
Total debt service/exports	39.2	31.6	50.7	40.3
Present value of debt/GDP	..	..	73.1	..
Present value of debt/exports	..	..	234.2	..

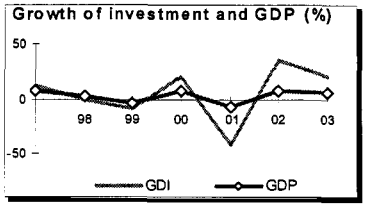
	1983-93	1993-03	2002	2003	2003-07
(average annual growth)					
GDP	5.0	2.7	7.9	5.8	5.6
GDP per capita	2.8	0.9	6.2	4.2	4.1

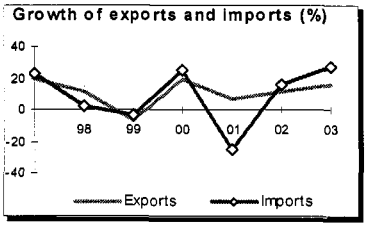


STRUCTURE of the ECONOMY

	1983	1993	2002	2003
(% of GDP)				
Agriculture	21.4	16.2	13.0	13.4
Industry	25.0	29.8	23.7	21.9
Manufacturing	16.8	18.3	14.0	13.3
Services	53.6	54.0	63.3	64.7
Private consumption	78.4	65.0	66.2	66.9
General government consumption	9.4	13.0	14.0	13.6
Imports of goods and services	16.6	19.3	30.7	30.7

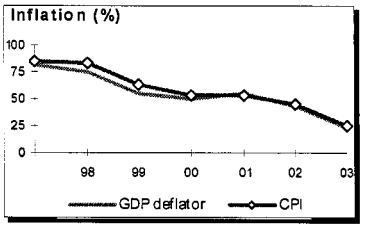
	1983-93	1993-03	2002	2003
(average annual growth)				
Agriculture	1.5	1.0	7.4	-2.4
Industry	6.7	2.2	5.6	5.0
Manufacturing	6.9	3.0	8.2	8.4
Services	4.3	3.0	7.3	6.4
Private consumption	4.7	1.9	2.2	6.7
General government consumption	4.0	3.9	5.4	-2.4
Gross domestic investment	7.7	1.0	35.9	20.4
Imports of goods and services	11.4	7.8	15.8	27.1





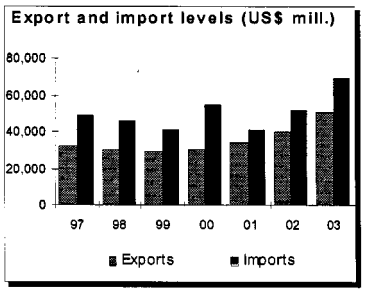
PRICES and GOVERNMENT FINANCE

	1983	1993	2002	2003
Domestic prices				
(% change)				
Consumer prices	31.4	66.4	44.8	25.2
Implicit GDP deflator	26.3	67.8	44.1	22.5
Government finance				
(% of GDP, includes current grants)				
Current revenue	..	19.0	31.2	30.4
Current budget balance	..	-3.1	-5.1	-5.3
Overall surplus/deficit	..	-12.0	-11.9	-10.1



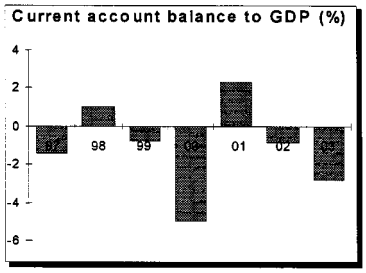
TRADE

	1983	1993	2002	2003
(US$ millions)				
Total exports (fob)	5,905	15,345	40,124	51,206
Agricultural and livestock	1,032	1,044	2,089	2,545
Mining and quarry products	188	233	387	543
Manufactures	4,685	14,068	33,565	43,912
Total imports (cif)	9,235	29,428	51,554	69,340
Food	123	969	1,245	2,006
Fuel and energy	3,851	3,903	9,192	11,568
Capital goods	2,311	7,499	9,103	11,792
Export price index *(1995=100)*	89	92	75	82
Import price index *(1995=100)*	100	85	73	83
Terms of trade *(1995=100)*	89	109	102	99



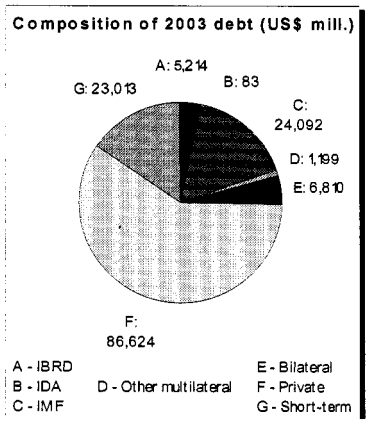
BALANCE of PAYMENTS

	1983	1993	2002	2003
(US$ millions)				
Exports of goods and services	7,865	26,264	54,907	70,231
Imports of goods and services	10,118	33,721	55,365	73,760
Resource balance	-2,253	-7,457	-458	-3,529
Net income	-1,430	-2,744	-4,554	-5,427
Net current transfers	1,760	3,768	3,490	2,106
Current account balance	-1,923	-6,433	-1,522	-6,850
Financing items (net)	2,075	6,741	7,675	10,897
Changes in net reserves	-152	-308	-6,153	-4,047
Memo:				
Reserves including gold *(US$ millions)*	2,253	17,762	38,051	44,957
Conversion rate *(DEC, local/US$)*	226.0	11,046.7	1,509,471	1,496,668



EXTERNAL DEBT and RESOURCE FLOWS

	1983	1993	2002	2003
(US$ millions)				
Total debt outstanding and disbursed	20,324	68,605	131,058	147,035
IBRD	2,336	5,285	5,367	5,214
IDA	184	142	89	83
Total debt service	3,138	8,664	29,092	29,172
IBRD	274	1,183	708	728
IDA	4	7	7	7
Composition of net resource flows				
Official grants	98	403	..	..
Official creditors	327	-740	224	-1,217
Private creditors	139	6,104	6,901	-511
Foreign direct investment	46	622	863	1,063
Portfolio equity	0	189	-1,183	2,250
World Bank program				
Commitments	675	207	1,650	0
Disbursements	486	354	1,031	276
Principal repayments	115	753	443	502



Annex 16: Maps

TURKEY: GAS SECTOR DEVELOPMENT

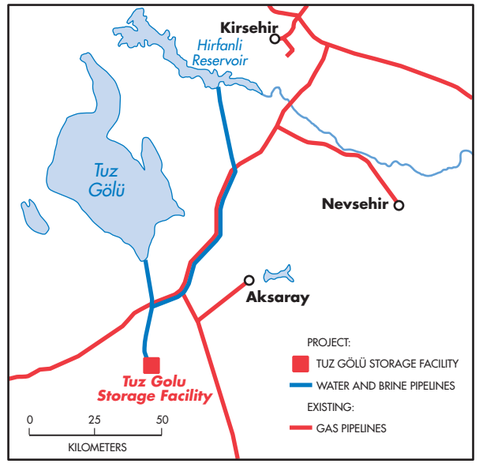
IBRD 34191

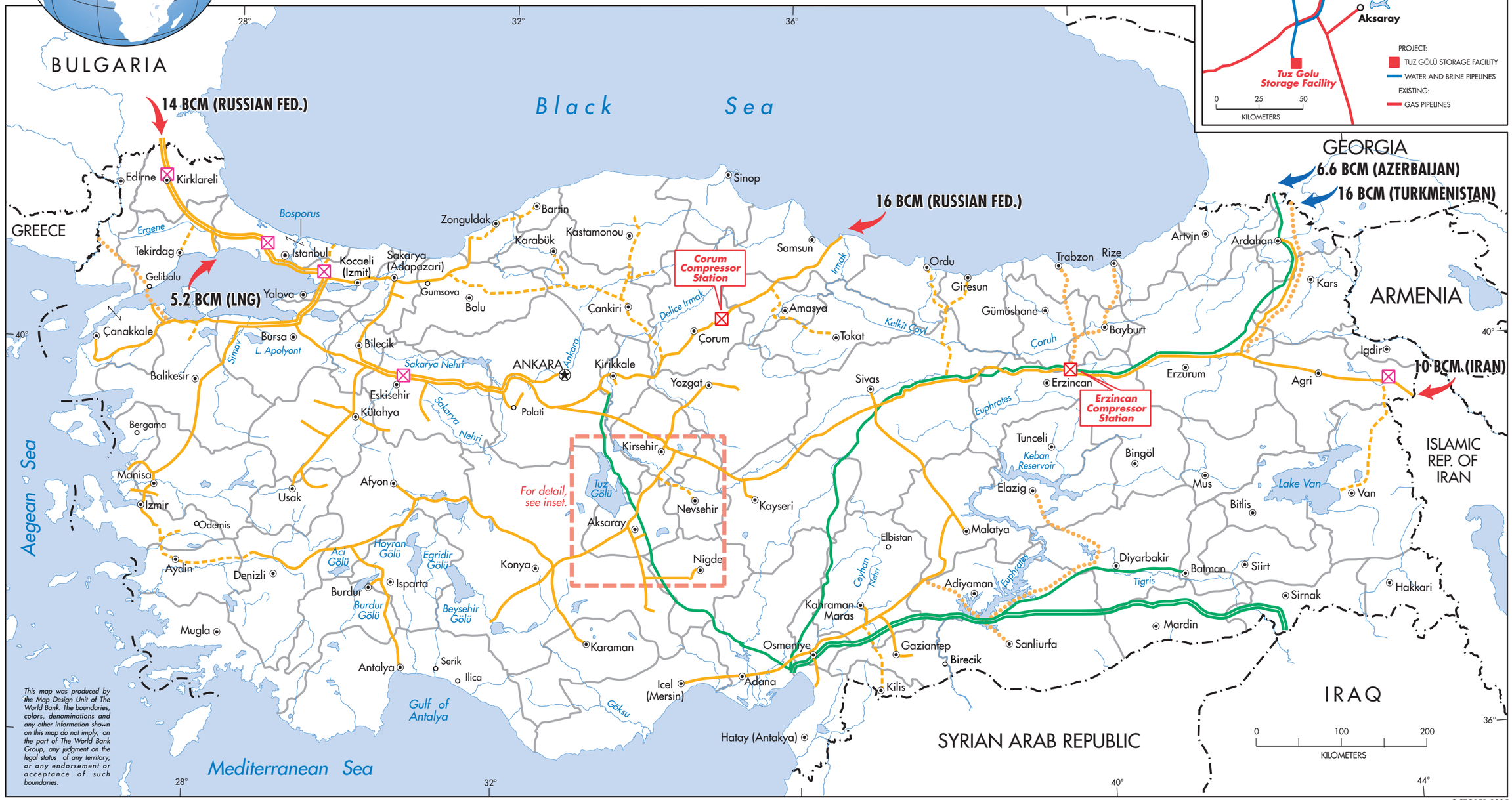
TURKEY

GAS SECTOR DEVELOPMENT PROJECT

- EXISTING GAS PIPELINES
- EXISTING OIL PIPELINES
- GAS PIPELINES UNDER CONSTRUCTION
- PROPOSED GAS PIPELINES
- EXISTING COMPRESSOR STATIONS
- NEW COMPRESSOR STATIONS
- NATURAL GAS IMPORTS
- PLANNED NATIURAL GAS IMPORTS
- PROVINCE CAPITALS*
- NATIONAL CAPITAL
- PROVINCE BOUNDARIES
- INTERNATIONAL BOUNDARIES

*Province names are the same as their capitals.





OCTOBER 2005