



# *Water Monitoring System in Syria*

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# *Water Monitoring System in Syria*

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# Water Monitoring System in Syria

## MAP OF SYRIA



### 1. Introduction:

- The Syrian Arab Republic is located on the eastern coast of the Mediterranean Sea. It is bordered by Turkey on the north, Iraq on the east, Jordan on the south, and the Mediterranean Sea, Lebanon and Palestine on the west.
- The Land surface area is 185,180 km<sup>2</sup>; one third of which is fertile lands and forests. The remainder is desert-like and mountainous terrains.
- The population of Syria is approximately 18,448,800 million

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## 2. Agriculture land use in Syria

- *Agriculture is a dominant economic sector in the SAR.*
- *Irrigated arable land accounted for approximately 50% of the total value of agricultural production.*
- *The development of 'advanced irrigation techniques' are significant if the ever increasing demand for agricultural production is to be met.*
- *However, even with 'advanced irrigation techniques' irrigation is faced with the major constraint of water scarcity.*



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## *3. Environmental Legislation:*

### *The main environmental legislative acts are:*

- Environmental Law 50 issued in 2002
- Cleanliness and aesthetics of the administrative units - Law No. 49 issued in 2004
- Forestry Law No. 7 issued in 1994
- Steppe Protection Law issued in 1973
- Legislative Decree No. 152 of year 1970, controlling wild hunting.
- Executive directives for the enforcement of Environmental law 50 issued in 2005

## *Water Monitoring System in Syria*

- *Environmental Law 50*

*The first integral environmental law ever issued in the Middle East, the Syrian Environmental Law No. 50 has established an environment protection council, composed of the chairman, the Deputy Prime Minister for Utilities, plus, eighteen additional members which includes: Ministers of Syrian Government, and heads of the Federation of Worker Syndicates, Women's Union and other organizations.*

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*"Cleanliness and aesthetics of the administrative units"*

- *Law No. 49 issued in 2004*

- *In chapter 7 of this law it states ~ "The followings are forbidden under penalty of executing punishment"*

- *To throw wastes of all kinds in rivers, water courses, fountains and the sands beside them by the passers or by the owners of shops, coffee shops, restaurants, and others.*
- *To throw all kinds of wastes in seas, lakes or coasts.*
- *To throw oils, grease, lubricants and similar substances of all kinds in the containers and water surface area or in the public sewerage and rivers. Who generates these substances must collect them in suitable cans and move them to places specified by the council.*

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## *"Forestry Law No. 7"*

- *Forestry Law No. 7 issued in 1994:*

*Under this law, State Forestry was deemed a national resource that shall in no manner be utilized or otherwise decreased by anyone, for which purpose the forestry law identifies the technical criteria, plus, legal and administrative constraints for forest development and protection with the Ministry of Agriculture and Agrarian Reform assigned to expand existing forest areas and establish forest conservation areas and protective belts for the separation of forests from adjoining residential or agricultural districts.*

*Water Monitoring System in Syria  
"Steppe Protection Law of 1973"*

*Steppe Protection Law issued in 1973:*

*The Steppe Protection Law was aimed at protecting steppe lands against desertification in order to preserve its animal grazing resources and diverse forms of vital and wild life.*

*Water Monitoring System in Syria  
"Legislative Decree No. 152 of year 1970"*

*Legislative Decree No. 152 of year 1970, controlling wild hunting:*

*It is important to note that included in these laws, penalties are applied to those breaking the laws.*

*The principle of environmental protection via a penalty system is common in the Syrian legislation. But enforcement of this policies need to be strengthened.*

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## *“Executive directives for the enforcement of Environmental law”*

### *Executive directives for the enforcement of Environmental law:*

*Criteria for maximum pollution from industrial waste into water environments issued by the Supreme Council for Environmental Safety in 13.05.2002 and approved under decision No. 67 dated 05.07.2003 to identify, among a total 39 criteria:*

*Color, pH, biological oxygen, chemical oxygen, oils and fats, total suspended solids, total dissolved solids, sedimentation, phosphates, ammonia, nitrates, fluorides, sulfides, chlorine residual, cyanide, cadmium, mercury, total heavy elements and total bacterial colonies.*

*The maximum allowable ratios for such criteria were duly noted under such norms for seawater, soil surfaces in areas of suspected infiltration into groundwater, river water and agricultural drainage channels.*

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## *4. Environmental protection Programs and Projects:*

*In the following are various programs and projects, which were lead by Syrian government and supported by UNDP and other donors thus have particularly focused on the environmental issues.*

- The formulation of a National Environmental Action Plan*
- Environmental Survey for Natural Resources;*
- Integrated Development for Water Resources in Syrian rangeland;*
- Integrated Biological Diversity Conservation;*
- The diversity conservative project and natural protected areas;*
- The green tie project; and Developing Al-Hamad Basin project.*

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## *Environmental protection Programs and Projects (cont.):*

- *Strengthening Capacity for the Reuse of Treated Wastewater in irrigation*
- *Integrated Waste Management for The Olive Oil pressing Industries in Lebanon , Syria & Jordan*
- *Solid Waste Management and Investment in Carbon Emissions Reduction in Syria, using the Clean Development Mechanism (CDM)*
- *Integrated Management for Landuse Planning*
- *The Capacity Development of Environmental Monitoring at Directorates for Environmental Affairs in Governorates*

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## **5. Current situation of the Water Monitoring System in the Governorates Syria's :**

- ◇ *In Syria, industrialization has been expanding ever since the 1980s and in addition to large-scale plants, such as, geothermal power generation plants, petroleum refining plants, cement plants, fertilizer plants, etc.*
- *The environmental problems caused by "point source" wastewater and "exhaust gases" discharged from these plants have become serious around the cities. This requires more efforts in order to protect water resources from pollution and to improve water quality.*
- *Nevertheless, a noticeable increase has been observed in the number of irrigated areas and reformed lands, number of water dams, and in the utilization of ground water.*
- *A database and network for water resources in the seven water basins has been established in Syria.*

## *Water Monitoring System in Syria*

### **Current situation of the Water Monitoring System in the Governorates Syria's (cont.):**

- *The responsible laboratories within the Ministry of Irrigation and the Ministry of Housing and construction are continuously monitoring basic water quality parameters.*
- *As for the monitoring of toxic micro pollutants (i.e., heavy metals, pesticides, polycyclic aromatic hydrocarbons (PAH), and halomethanes), they are analyzed on a yearly basis by the Environmental Research Laboratory at the Higher Institute of Applied Sciences and Technology (HIASST).*

# *Water Monitoring System in Syria*

## **Current situation of the Water Monitoring System in Syria (cont.):**

- *In addition the Ministry of Local Administration and Environment established 14 Directorates for Environment Affairs (DFAAs) in each of the 14 governorates Syria's.*
- *These DFAAs are responsible for environment administration, environmental monitoring, and educational activities for residents in each governorate, but were struggling with a lack of technical capacity and materials, etc. Based on this situation, a project regarding capacity development for the DFAAs entitled "The Capacity Development of Environmental Monitoring at Directorates for Environmental Affairs in Governorates" was started in 2002, which focus on the following*

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## *Project purpose:*

*The target Directorate for Environmental Affairs in Governorates have the responsibility to introduce and conduct regular monitoring of the legislated (required) parameters for water and air quality according to the monitoring plan formulated by the directorates themselves and to implement activities for public awareness including publication of the monitoring results.*

# *Water Monitoring System in Syria*

## *The Project's Outputs In the target Directorates:*

- *Technical level of laboratory staff concerning environmental sampling and analysis is improved.*
- *Laboratories are properly managed by laboratory staff themselves*
- *Environmental analysis data is accumulated and properly managed.*



## The Project's Outputs In the target Directorates ( Cont.):

- *Laboratory staff is able to formulate an environmental monitoring plan specifying parameters required.*
- *The results and data acquired by the Project is open to and shared with the citizens of the target Directorates.*
- *Staff of target Directorates is able to formulate its action plan for public awareness and environmental education.*



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## *Project Activities:*

- *The DFLAs undertake a Water Monitoring Plan for the water quality in rivers, in wells, and in the ground water.*
- *In addition, the DFLAs inspectors check regularly the pollutants discharge from the municipalities and industries.*
- *The following table illustrated the chemical and biological analyses, which are regularly undertaken in DFLAs:*







# *Water Monitoring System in Syria*

## *Monitoring Campaigns Results:*

- *during the project's period Water Monitoring Campaigns were undertaken ( industrial waste water samples , surface water and groundwater samples were analyzed).*
- *The monitoring campaign results which were undertaken by the DFLAs, indicate that surface and groundwater are contaminated in many areas with domestic and industrial wastewater*

# *Water Monitoring System in Syria*

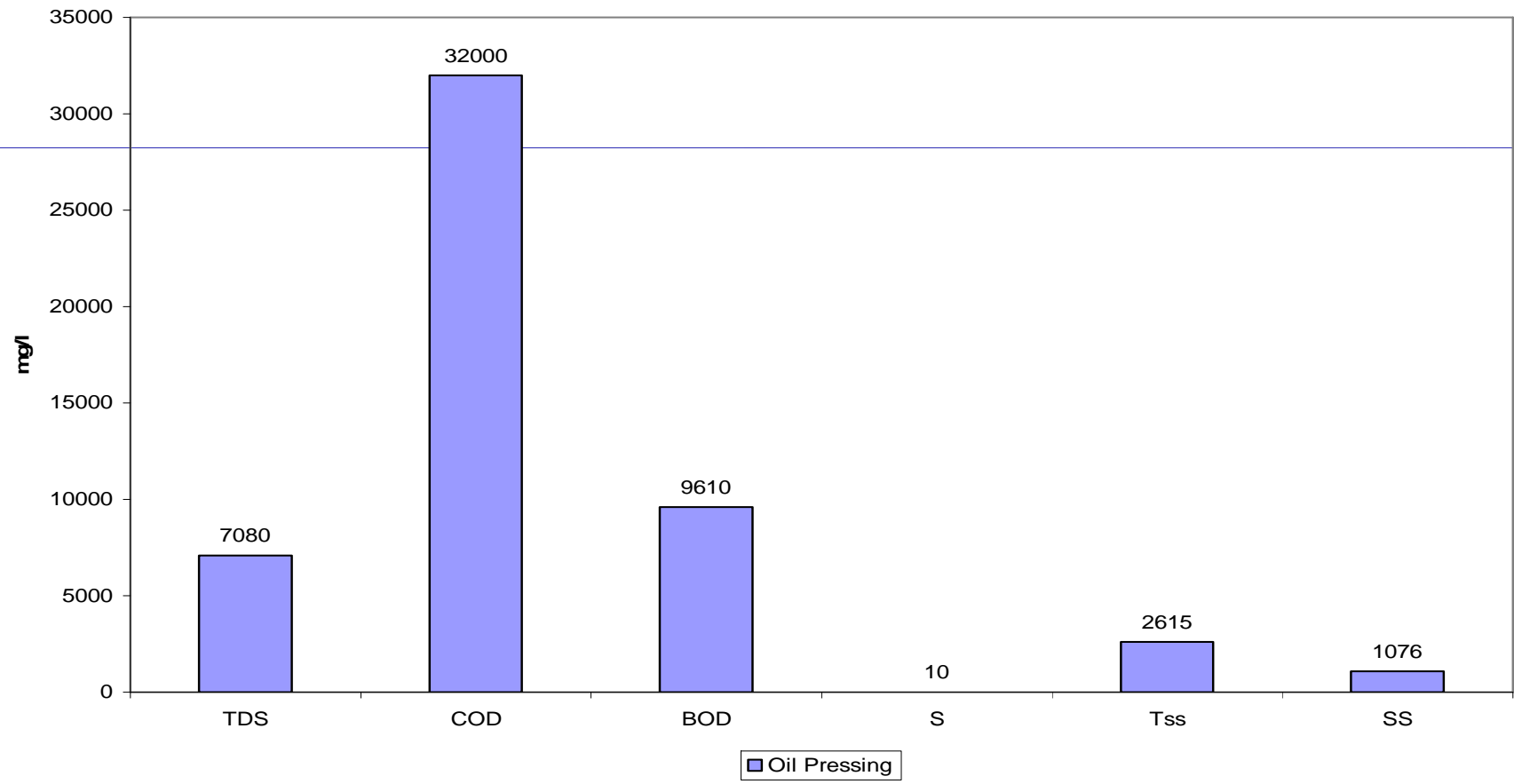
## *Olive pressing Factory :*

- *The olive pressing sector in Syria consists of a number of small olive processing factories. The factories are concentrated in the governorates where olive groves are located. The liquid waste of the olive pressing factories is a primary reason for groundwater pollution in these areas..*

## Standard Value Waste Water

TDS mg/l	COD mg/l	BOD mg/l	S mg/l	Tss mg/l	SS mg/l
1200	150	40	1.0	30	--

Oil Pressing

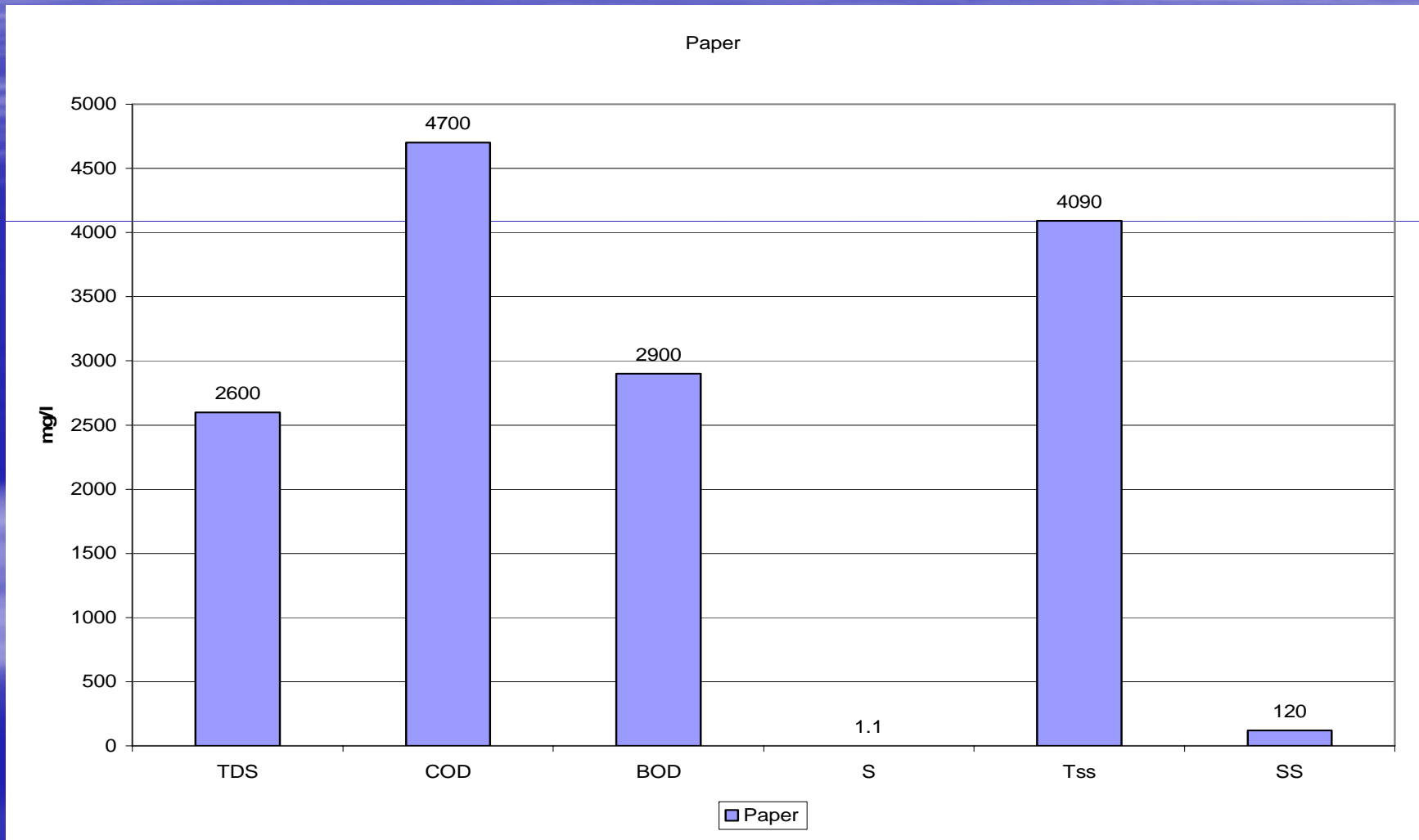


# *Water Monitoring System in Syria*

- *Paper Factory:*
- *The analytical results of wastewater samples taken from paper factories show a great variation to the Standard value in the BOD, COD and TDS, ... etc.*

## Standard Value Waste Water

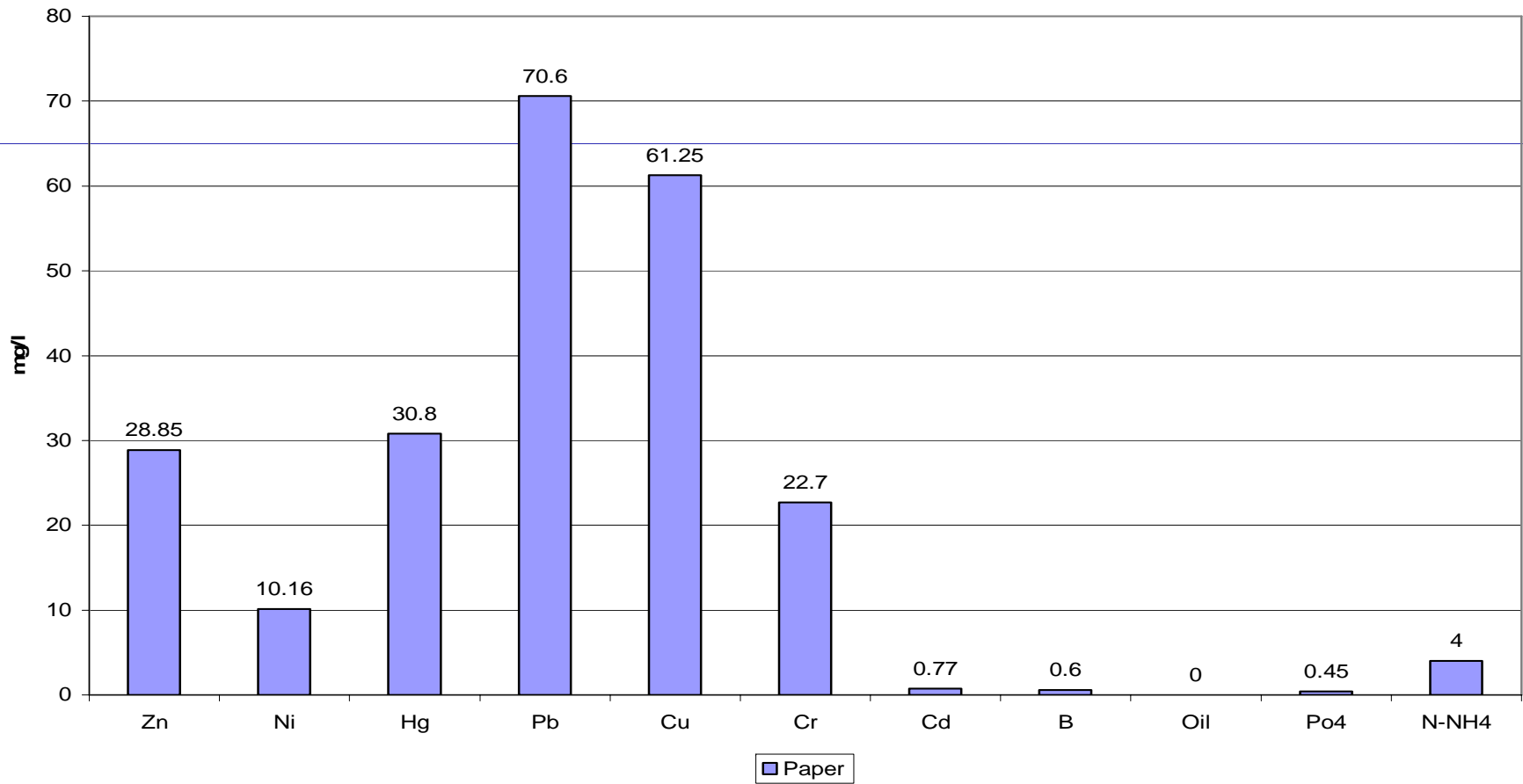
TDS mg/l	COD mg/l	BOD mg/l	S mg/l	Tss mg/l	SS mg/l
1200	150	40	1.0	30	--



## Standard Value Waste Water

Zn mg/l	Ni mg/l	Hg mg/l	Pb mg/l	Cu mg/l	Cr mg/l	Cd mg/l	B mg/l	Oil mg/l	Po4 mg/l	N-NH4 mg/l
2	0.3	0.005	0.2	0.2	0.5	0.05	1.0	10	15	5

Paper



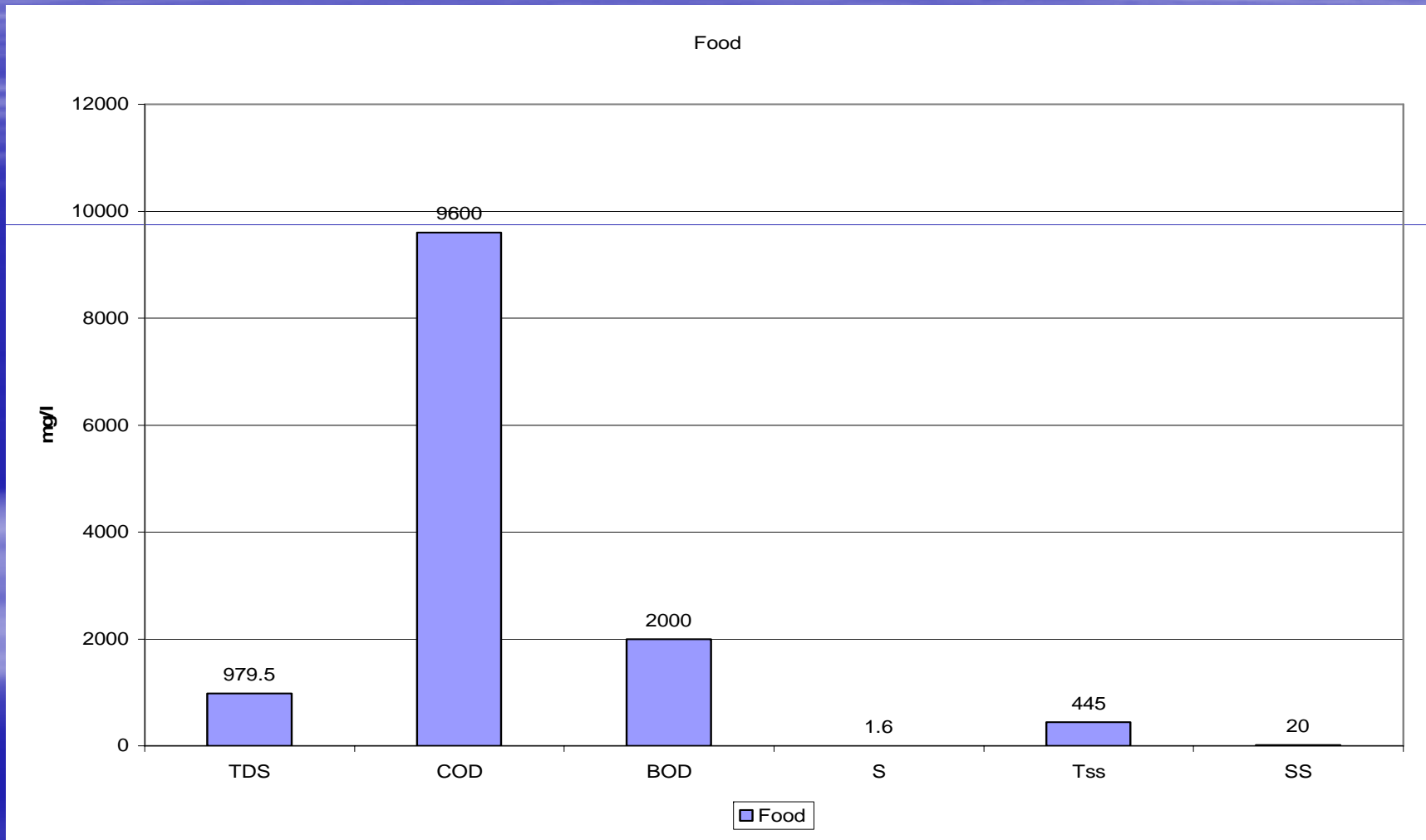
# *Water Monitoring System in Syria*

## *Food Factories:*

- *The Food Factories are an important industrial sector in Syria, it consist of many small factories, located in many cities and rural areas across the Country*
- *The Following Diagram shows the analytical results of a meat canning factories*

## Standard Value Waste Water

TDS mg/l	COD mg/l	BOD mg/l	S mg/l	Tss mg/l	SS mg/l
1200	150	40	1.0	30	--



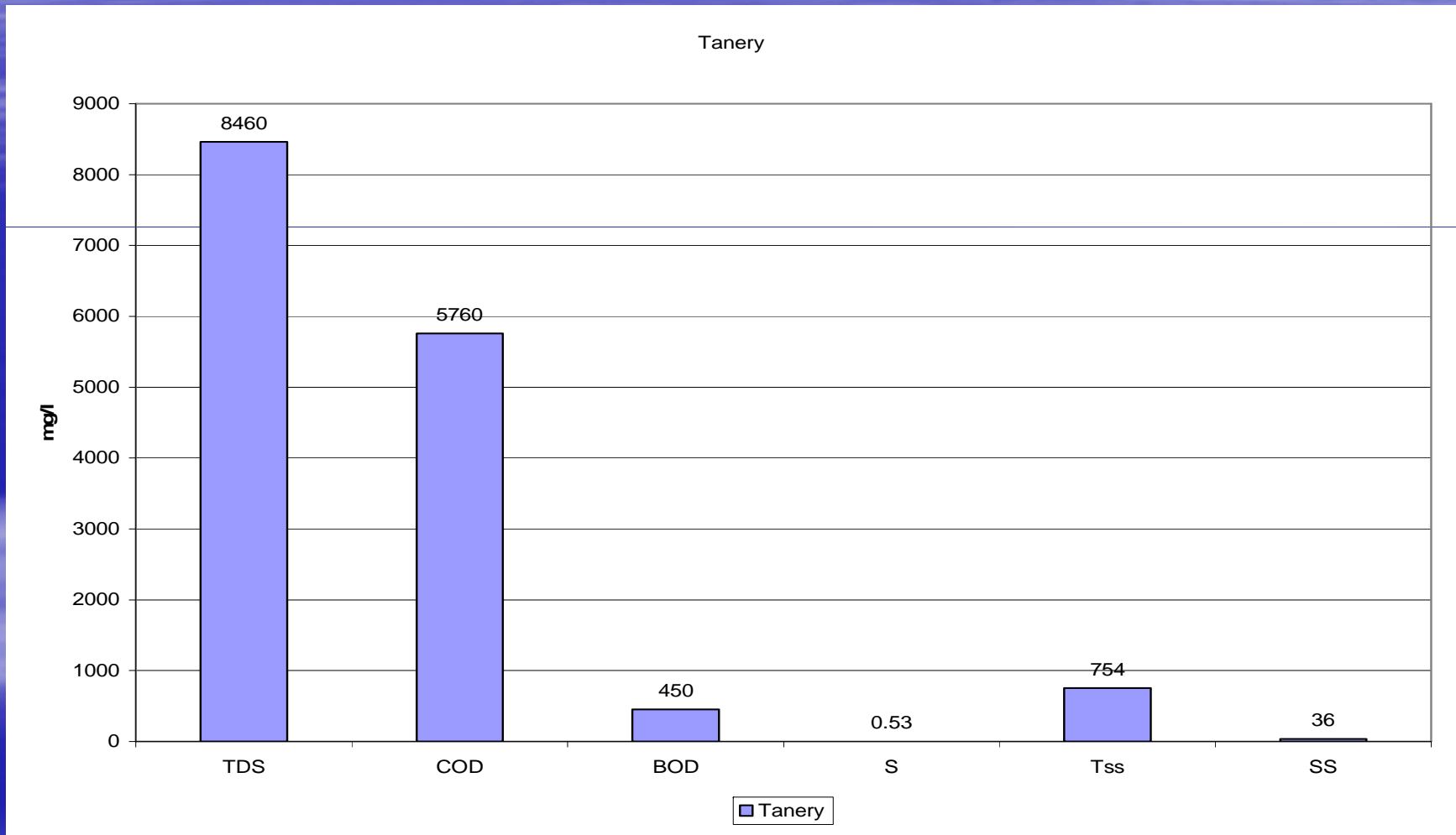
# *Water Monitoring System in Syria*

## *Tannery factories*

- *Analytical results of the wastewater effluent from tannery factories are similar to each other; all having a big variation with the required standards. the Diagram shows the analytical results of a relevant tannery factory in Damascus*

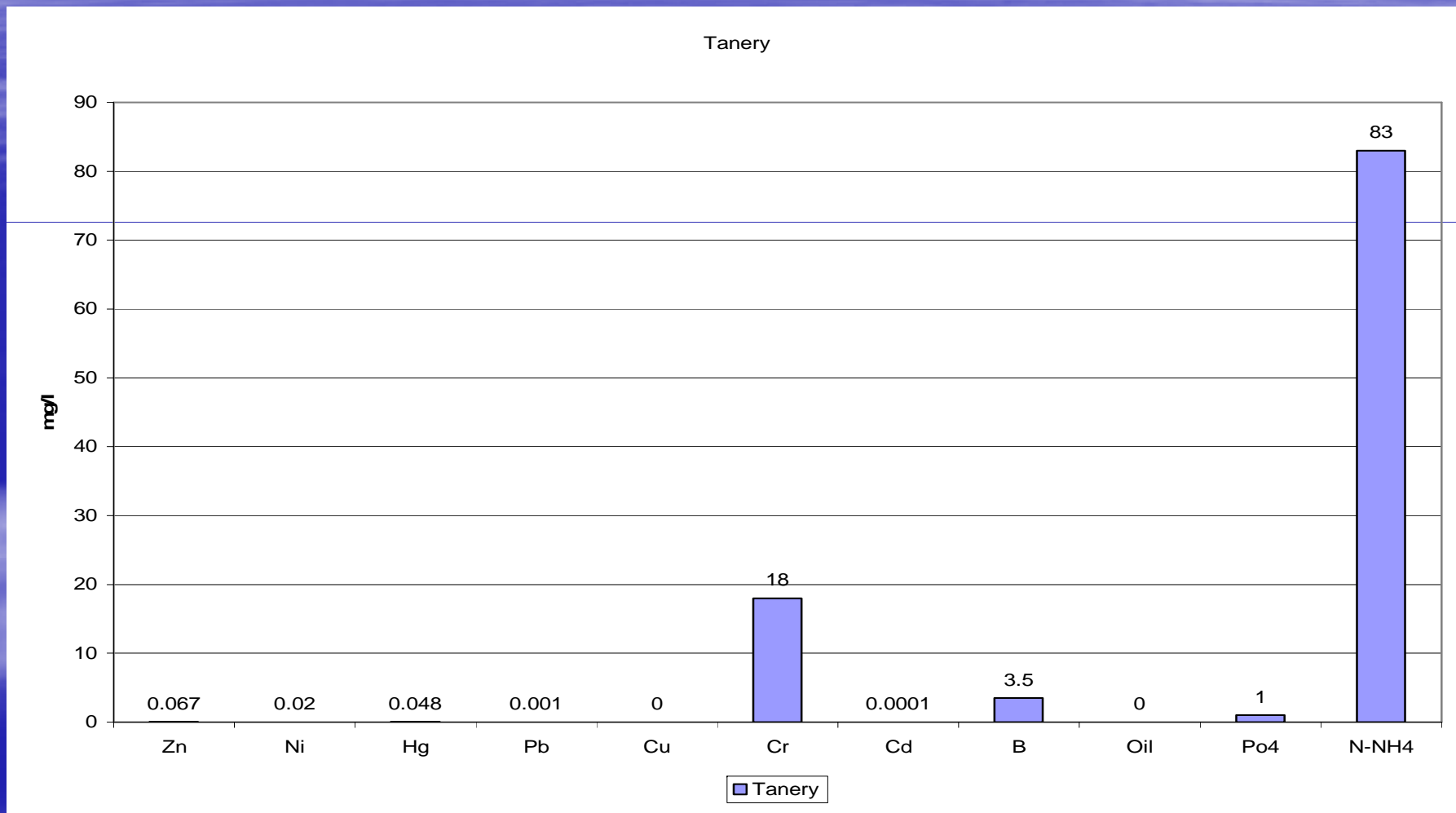
## Standard Value Waste Water

TDS mg/l	COD mg/l	BOD mg/l	S mg/l	Tss mg/l	SS mg/l
1200	150	40	1.0	30	--



### Standard Value Waste Water

Zn mg/l	Ni mg/l	Hg mg/l	Pb mg/l	Cu mg/l	Cr mg/l	Cd mg/l	B mg/l	Oil mg/l	Po4 mg/l	N-NH4 mg/l
2	0.3	0.005	0.2	0.2	0.5	0.05	1.0	10	15	5



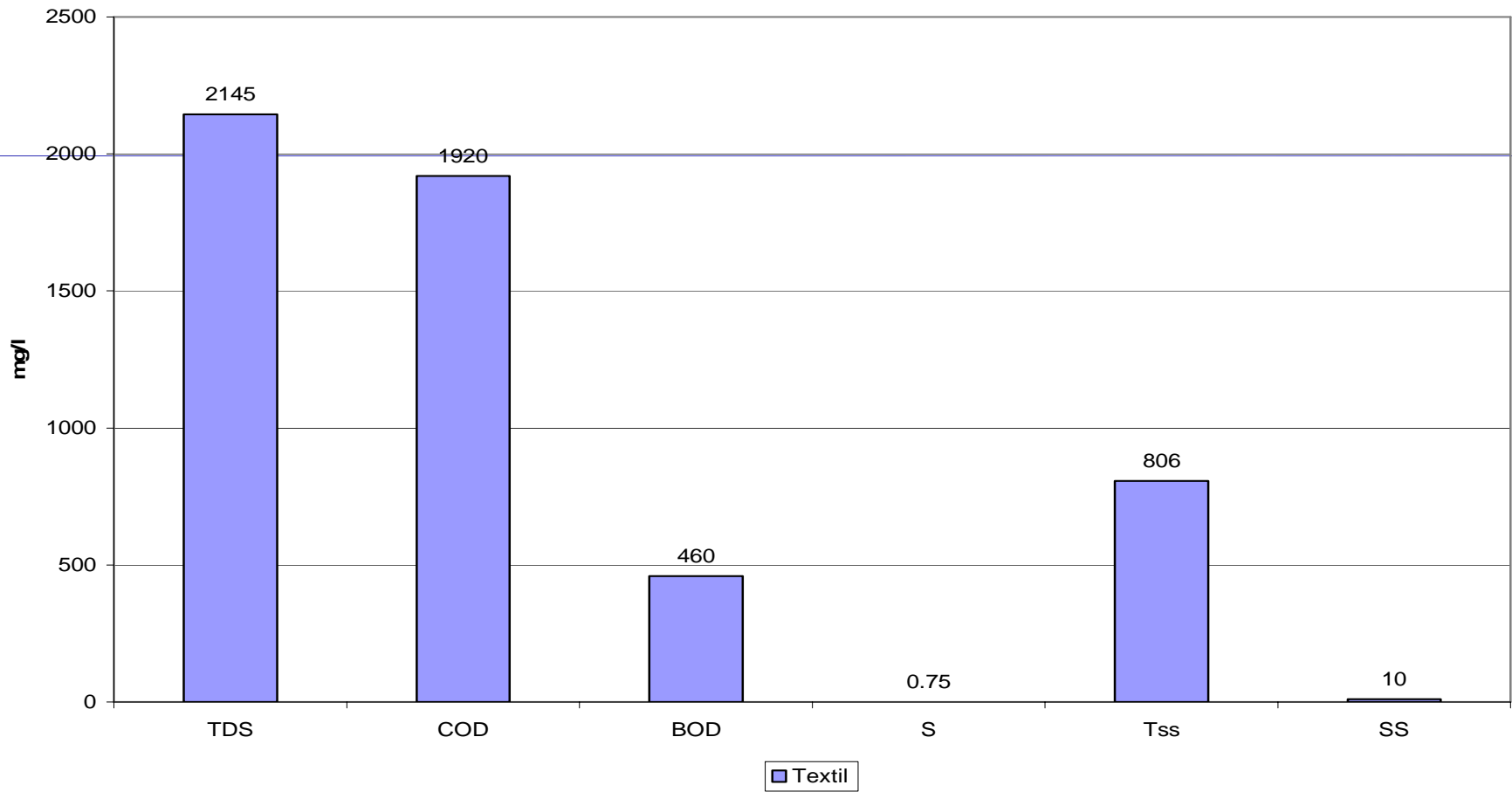
## *Water Monitoring System in Syria*

- *In general the textile industries are one of the highest polluting factory-types in the Country.*
- *The following Diagrams show the analytical results of the monitored factories in which the high value of the COD and TDS are to be seen.*

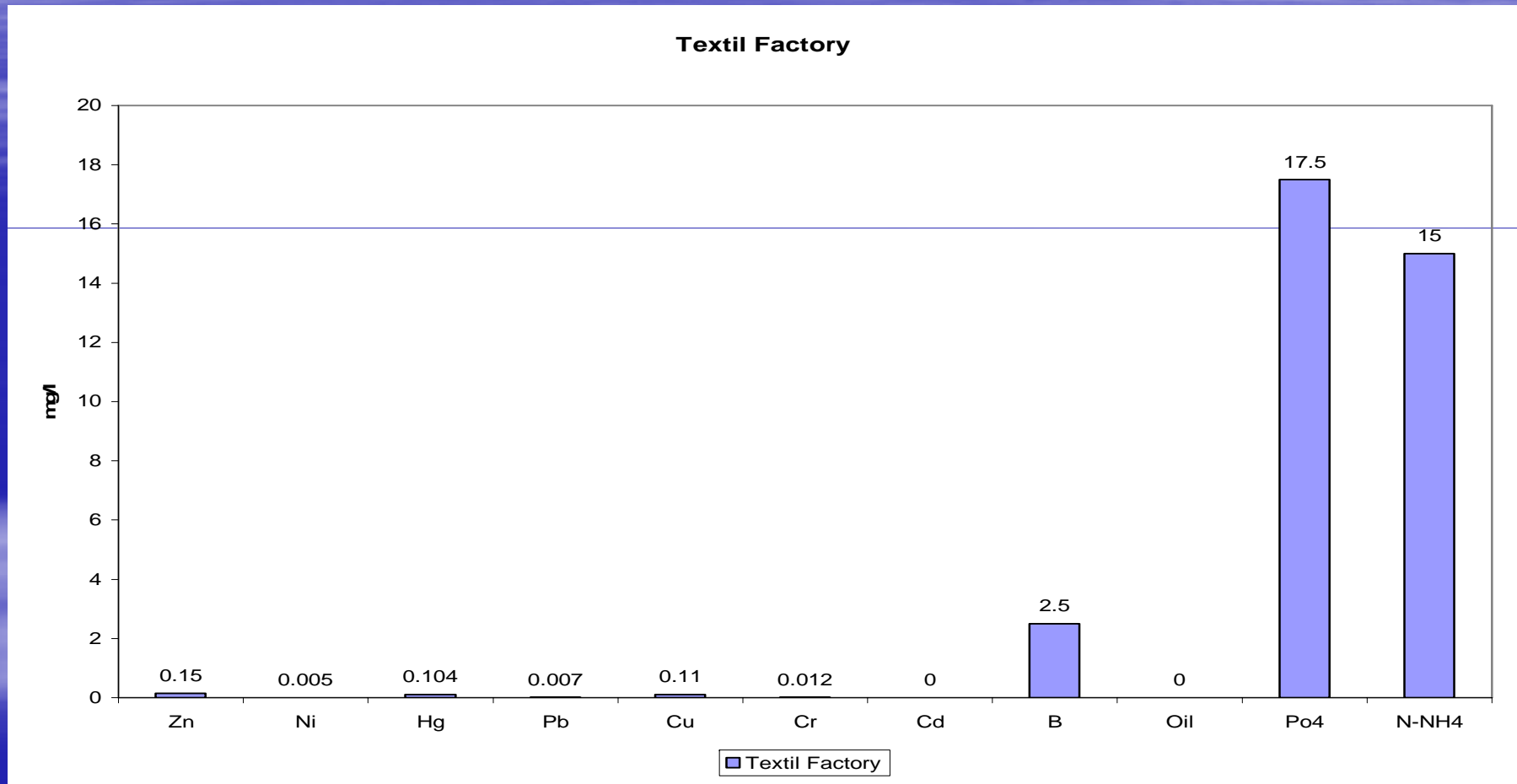
### Standard Value Waste Water

TDS mg/l	COD mg/l	BOD mg/l	S mg/l	Tss mg/l	SS mg/l
1200	150	40	1.0	30	--

Textil



Standard Value Waste Water										
Zn mg/l	Ni mg/l	Hg mg/l	Pb mg/l	Cu mg/l	Cr mg/l	Cd mg/l	B mg/l	Oil mg/l	Po4 mg/l	N-NH4 mg/l
2	0.3	0.005	0.2	0.2	0.5	0.05	1.0	10	15	5



# *DFEA's inspections and the water analyze*

## *Conclusions:*

*The results of the DFEA's inspections and the water analyze show that:*

- *In almost all cases the wastewater from industries flows into an open source*
- *Most of the industries do not have wastewater treatment facilities; and others have only insufficient treatment technologies and facilities.*
- *The... geographical location of most industries cause complication by the assignment of the polluter and the grade of the pollution.*
- *The industries' owners have very low environmental awareness that cause a big difficulty by the achievement of DFEA's mission.*
- *In General, the analytical results of the industrial wastewater showed that the amount of the BOD, COD, ... and other parameters are higher than the acceptable standard value (Standard No. - 1850 2752 ).*