

# Aspects of Petroleum and Petroleum Products Pollution, in Romania and Measures against Pollution Effects

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## Abstract

*Pollution and environment protection are considered to be among the most important problems facing Romanian society and mankind in general. Transformations taking place globally in terms of environment quality require finding some solutions for maintaining planet's Ecological balance in terms of sustainable development. In the paper we propose to present petroleum and petroleum products environment pollution situation and also the measures required for improving this situation.*

**Key words:** *pollution, environment, petroleum, protection, soil.*

## Introduction

Environment protection is a priority of economical and social development and its purpose is creating a healthy and clean environment that wouldn't affect development possibilities of future generations. Environment protection and natural resources preserve are necessary in accordance with a sustainable economic and social development request. Also, for reaching these objectives, increasing the awareness and education level of population are needed (1),

For making environment protection efficiently, a complex of well correlated activities and actions are also needed, to increase health and environment conditions of the entire population. That involves development of an appropriate mentality of the community, a realistic evaluation of environment problems, establishing the priorities, elaboration of appropriate strategies for solving them. Last but not least, changing the attitude and awareness concerning environment and civic responsibility helps us to transmit a clean and healthy environment for future generations, respecting the three dimensions of sustainable development : economic, ecological and social .

## Paper data

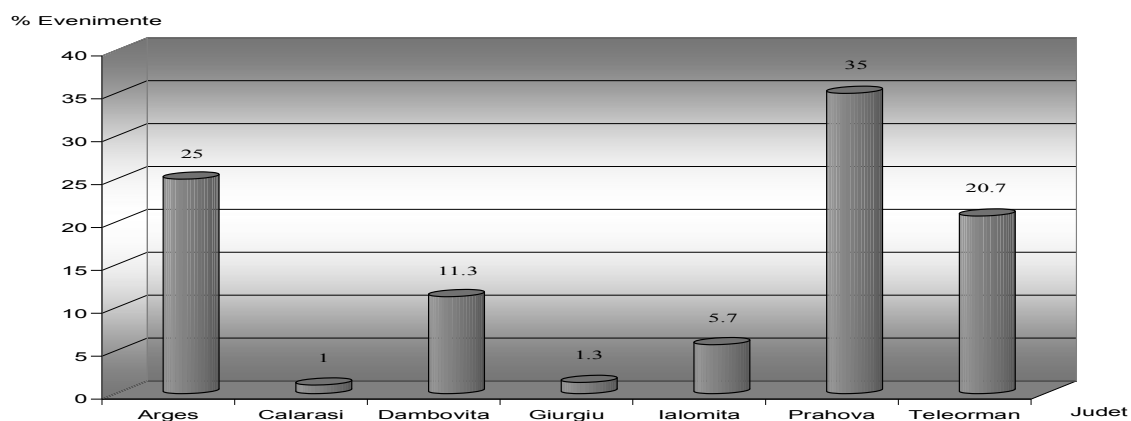
Geographically grouped, pollution situation in Romania between 2002 and 2009 looks like that:

**South-Muntenia** region includes Arges, Calarasi, Dambovita, Giurgiu, Ialomita, Prahova and Teleorman counties.

According to the data provided by the Environment Protection Agency, the pollution situation in South-Muntenia region between 2002 and 2009 is presented in Tab.1 and graphically shown in Fig.1.

**Tab.1.** Geographical repartition of pollution events in South-Muntenia region.

Crt.nr.	County name	% of evens
1	Arges	25
2	Calarasi	1.0
3	Dambovita	11.3
4	Giurgiu	1.5
5	Ialomita	5.5
6	Prahova	35.0
7	Teleorman	20.7



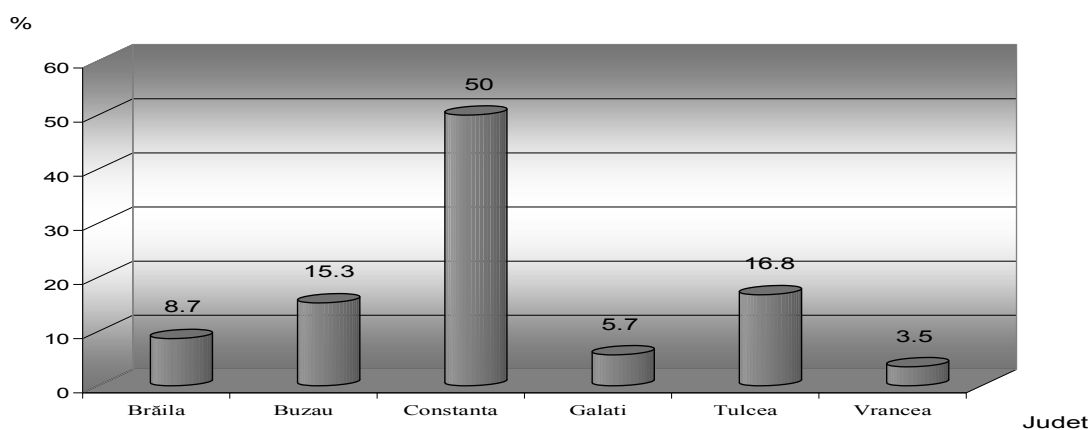
**Fig.1.** Geographical repartition of pollution events in South-Muntenia region

**South-East** region includes Braila, Buzau, Constanta, Galati, Tulcea and Vrancea counties (2).

According to the data provided by the Environment Protection Agency, the pollution situation in South-East region between 2002 and 2009 is presented in Tab.2 and graphically shown in Fig.2.

**Tab.2.** Geographical repartition of pollution events in South-East region

Crt.nr.	County name	% of evens
1	Braila	8.5
2	Buzau	15.3
3	Constanta	50.0
4	Galati	5.7
5	Tulcea	17.0
6	Vrancea	3.5



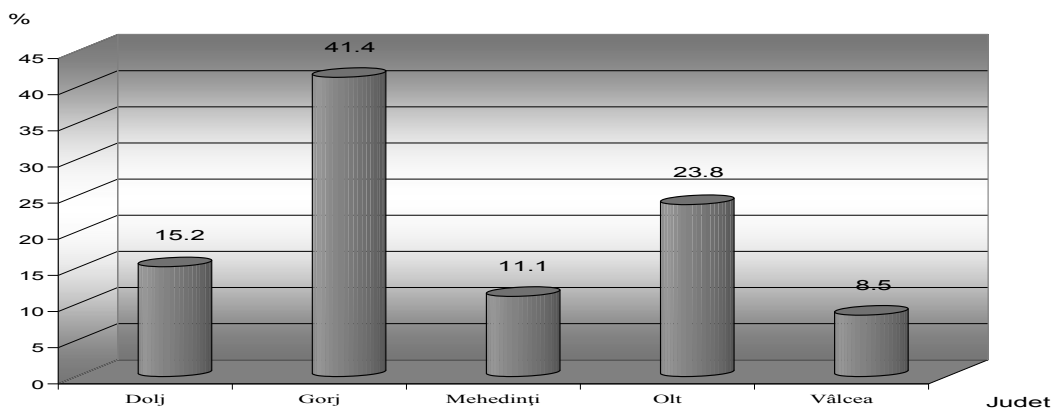
**Fig.2.** Geographical repartition of pollution events in South-East region

**South-West-Oltenia** region includes Dolj, Gorj, Mehedinti, Olt and Valcea counties.

According to the data provided by the Environment Protection Agency, the pollution situation in South-West-Oltenia region between 2002 and 2009 is presented in Tab.3 and graphically shown in Fig.3.

**Tab.3.** Geographical repartition of pollution events in South-West-Oltenia region

Crt.nr.	County name	% of evens
1	Dolj	15.2
2	Gorj	41.4
3	Mehedinti	11.1
4	Olt	24.0
5	Valcea	8.3



**Fig.3.** Geographical repartition of pollution events in South-West-Oltenia region

**West** region includes Arad, Caras-Severin, Hunedoara, and Timis counties. Generally, in this region were registered very few petroleum pollution events.

**North-West** region includes Bihor, Bistrita-Nasaud, Cluj, Maramures, Satu-Mare and Salaj counties. In this region petroleum pollution events that were registered were on very small surfaces.

**Central** region includes Alba, Brasov, Covasna, Harghita, Mures and Sibiu counties. Generally, in this region were registered very few petroleum pollution events.

**Bucuresti** region includes Bucuresti City and Ilfov county. In

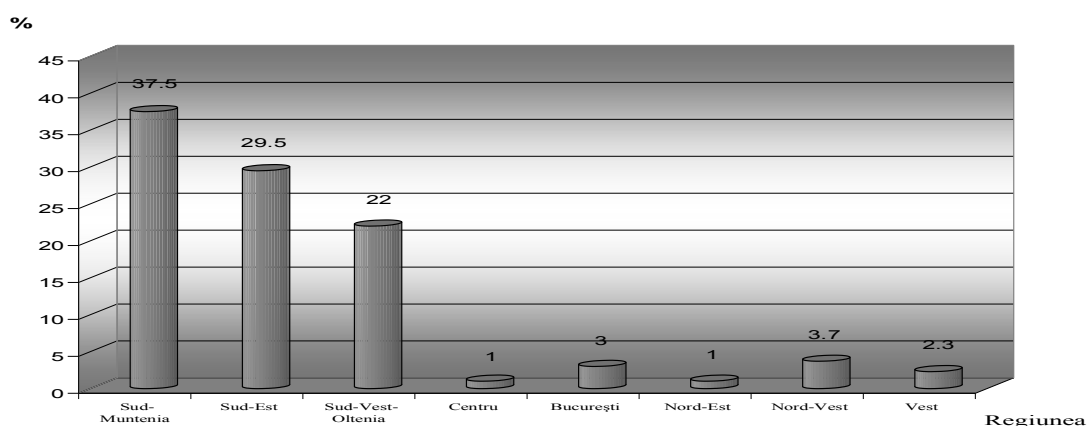
Bucuresti City and Ilfov county petroleum pollution events were very small and caused by discharge of petroleum products in the sewage network.

**North-East** region includes Bacau, Botosani, Iasi, Neamt, Suceava and Vaslui counties. This is a region where very few events were registered.

According to the data presented before, we can make a percentage distribution of events which caused water and soil petroleum pollution. This distribution is presented in Tab.4. and graphically shown in Fig.4.

**Tab.4.** Petroleum and petroleum products pollution events distribution between 2002 and 2009

Crt.nr.	Region name	% of events
1	South-Muntenia	37.5
2	South-East	29.5
3	South-West-Oltenia	22.0
4	Central	1.0
5	Bucuresti	3.0
6	North-East	1.0
7	North-West	4.0
8	West	2.0



**Fig.4.** Petroleum and petroleum products pollution events distribution between 2002 and 2009

Analysing these data, we can see that the most affected regions by petroleum and petroleum products pollution are South-Muntenia, South-East and South-West-Oltenia, the less affected being North-East, Central and West regions. The big concentration of events in these regions is determined by the fact that in these areas we have an important amount of petroleum and petroleum products mining, processing and transportation activities. Even the pollution incidents and accidents constantly decreased during the last few years, critical areas from a pollution point of view still remain as: Prahova-Teleajen, Borzesti, and Onesti because of mining activities. In these areas we can consider that a "historical pollution" exists, although works for remediation and rehabilitation have been done. Also, among the industrial objectives where fervently the soil quality indicators are nonconforming from a pollution point of view are Videle and Poieni Oil scaffolds from Teleorman county. In Dambovita county a significant impact on the environment of oil mining activities is also registered. We can see here a salted soil and water effect at surface and underground (4).

Even between 2002 and 2009 was a lot of pollution events, in most of the cases the effects of accidental pollution were removed in short time, applying the following specific measures:

- correcting faults, replacing the affected sections and equipments.
- stop pumping operations till causes for accidental pollution were discovered and eliminated.
- development of dams with absorbing cords.
- development of soil dams and collection pits downstream.
- septage collection of oil drained.
- spreading absorbent substances "spill - sorbs" type.
- scraping polluted soil and replacing it.
- greening the land affected and using it again in agriculture

For the areas where remediation works have not been done yet, these will be done in the near future period according with the actual Environment Protection laws (3).

## **Conclusions**

In Romania, environment protection problems are sharp due to local pollution made mainly in mining and oil fields areas. A significant part of pollution can be prevented with simple and less expensive measures internal management. To establish an efficient system to treat environment problems means to elaborate a balanced plan to improve the performance in this area and for measuring the progress in reaching the proposed objectives.

The strategic objectives for environment protection in Romania need to register into the overall objectives of the activities developed by the National Action Plan for Environment Protection from Romania.

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## Aspecte ale poluării cu petrol și produse petroliere în România și măsuri împotriva efectelor poluării

### Rezumat

*Poluarea și protecția mediului sunt considerate printre cele mai importante probleme la care România și omenirea în general trebuie să le facă. Transformările ce au loc la nivel global în calitatea mediului înconjurător impun găsirea unor soluții pentru menținerea echilibrului ecologic al planetei pentru o dezvoltare durabilă. Lucrarea își propune să prezinte situația poluării mediului cu petrol și produse petroliere precum și măsurile cerute pentru îmbunătățirea situației.*