

Environmental Report  
for  
PUZ - Waste oil recycling plant

## **Environment report**

**BENEFICIARY:** GREEN OIL AND LUBES SRL

**ELABORATOR:** SC SMART ECOLOGIC CONSULTING SRL

Executive manager: engineer Florin STANICA

(Registered in The National Register for elaborators of environmental studies on no. 309, for studies type: **RM, RIM, BM, RAS, and EA**)

Executive manager: engineer Florin STANICA

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### **RESPONSIBLE:**

Project coordinator: ecologist engineer Brindusa BUTNARU,

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## INTRODUCTORY NOTE

This paper represents the Environmental Report for the Zonal Urbanism Plan for "**Waste oil recycling plant, Municipality of Oltenita, Calarasi county**" and was developed in accordance with the requirements of G.D. no. 1076/08.07.2004 on establishing the procedure for the environmental assessment for plans and programs and with the recommendations contained in the Handbook for the application of the procedure of environmental assessment for plans and programs developed by the Ministry of Environment and Water, along with the National Agency for Environment protection.

The environmental report is the document that contains information and conclusions of the environmental assessment for the zonal urban plan.

The paper was prepared in accordance with G.D. no. 1076/08.07.2004 on establishing the procedure for the environmental assessment for plans and programs.

The environmental assessment for plans and programs can be defined as a formal process, a systematic and comprehensive assessment of the effects of a strategy, of a plan or program and/or their alternatives, including the written report on the results of this assessment and use those results in making decisions.

The environmental assessment for plans and programs represent an evaluation process - applied to a rationally early stage on the elaboration of strategies, plans or programs - environmental quality and the consequences of their implementation so as to ensure that any result is evaluated during and before formal approval of strategies, plans or programs. The environmental assessment process for plans and programs offer the public and other stakeholders the opportunity to participate and be informed about decisions that may have an impact on the environment and the way they have been made.

European Union Directive on Strategic Environmental Assessment (SEA) no. 2001/42 /EC was adopted into national legislation by GD. 1076/08.07.2004 on establishing the procedure for the environmental assessment for plans and programs.

In accordance with the requirements of GD no. 1076/08.07.2004, the procedure of achieving the environmental assessment for the project included the following steps:

- Preparation by the holder of the first version of the plan;
- Notification by the holder of the Environmental Protection Agency Arges and public information;
- Stage of establishing a Special Committee consisting of representatives of the Prefecture of the Calarasi County, Calarasi County Council, Environmental Guard, Environmental Protection Agency Calarasi, the National Administration "Romanian Waters", Town Hall of Oltenita Inspectorate for Emergency Situations Calarasi and architect and environmental consultant, created the environmental Protection Agency Calarasi;
- The stage of of admission made by the Special Committee constituted;

- Stage of establishing a Working Group consisting of: representatives of the City Council Oltenita, holder of the plan, representatives with capacity of technical expertise from the authorities/institutions/organizations involved in the Committee especially constituted, experts from the certified consultancy company - SC SMART ENVIRONMENTAL CONSULTING Ltd, engaged in carrying out the environmental assessment for the plan;
- Stage for completion of the plan and achievement of the environmental report, conducted by experts from the consulting company with consultation and wide participation of the Working Group within several meetings;
- Subjecting the draft plan and environmental report to public debates, made by the competent environmental authorities and other authorities together with the plan holder.

Based on the opinions of the competent environmental authorities and other authorities in the stage of analysis of the environmental report and based on comments of the public, the final drafts of the plan and the environmental report will be prepared.

It is stated that members of the Working Group were consulted in Work meetings in connection with all the key elements needed to perform the environmental assessment as required by Government Decision no. 1076 /08.07.2004, namely:

- The content of the environmental report;
- The relationship of the plan with other plans and programs;
- The environmental problems existing in the area;
- Environmental factors / matters with relevance to the plan;
- Environmental objectives relevant to the plan, targets and indicators;
- Criteria for determining the likely significant effects of the plan on the environment;
- Categories of impact, format and content of the assessment matrix significant on the potential environmental effects of the plan's provisions;
- The expansion and detailing level of the the environmental assessment, respectively, of the environmental report;
- Evaluation of alternatives and selecting the best options for environmental protection;
- Conclusions on the results of the environmental assessment;
- Proposals for reduction / elimination of the impact of the plan on the environment;

- Proposals for monitoring the plan provisions regarding the reduction / elimination of environmental negative impacts and monitoring the effects of the plan on the environment.

Opinions of the Working Group were included in the environmental assessment process and in developing the environmental report.

It is mentioned that, for each meeting of the Working Group, the plan holder with the experts from the consulting companies prepared materials suitable for the topics to facilitate the activity of the Working Group members.

## **1. Exposing the content and the main objectives of the plan or program, as well as the relationship with other relevant plans and programs**

### **1.1. Introduction**

Beneficiary of the investment - GREEN OIL AND LUBES SRL wishes to build a used oil recycling plant with a capacity of 200 tonnes/day. The development of this economic activity is also crucial against the background of the obligations undertaken by ROMANIA for waste management and waste recycling according to the European directives.

### **1.2. The contents and the main objectives of the project**

#### **CURRENT SITUATION**

At present, in Romania there are no facilities - used oil recycling plants – of this capacity as compared to the investment proposed by GREEN OIL AND LUBES SRL. In this respect, a very small quantity of the used oils is collected to be recycled at country level. As a case study concerning the economic impact and environmental impact concerning waste management - in this case used oil, car services will be used as an example. In this respect, a small quantity of the used oils is recycled by authorized companies. Most amounts of waste - used oils are either discharged into sewerage drains or watercourses, causing an extremely negative environmental impact, or are burned in poor facilities, also having an environmental impact in the context of toxic emissions. When an economic operator is set up and will pay for the acquisition of the amount of used oils, the car service will be directly interested in adhering to this economic flow, both economically and in terms of risks taken so far with regard to the management of the resulting waste.

On the date of drafting the hereby documentation, the site is free from constructions.

Location data taken from approved topographic documentation (70 stereo) are taken into consideration.

The studied land will remain in the built area, but it will change its category of use into industrial land, and the authorization of proposed works will be made by the Local Council of Oltenita, with the observance of the technical authorization documentation (DTAC), after approving the Area Urban Plan.

The studied area will have a single Reference Territorial Unit (UTR1) - industrial area (industrial constructions and activities).

The town planning-regulated area is 17,88 ha and will accommodate the premises of the plant.

Providing legal requirement for landscaping (minimum 26 sqm / user) will be conducted by arranging landscaping on land areas remaining free from buildings inside the enclosure studied. The obligation of planting minimum one tree per 100 square meters of buildings free space will also be provided at the level of the local urban planning regulations.

The land is located within the limits of Oltenita town and is regulated by the town planning documentation - PUG phase - developed and approved in 2013. Current category of use is non-productive land. The land subject to the investment is arable land.

The objective of the investment is located within the limits of Oltenita town, Calarasi County. The address of the property is field 89, plot A5774. The area of the property in question (the property under review) is of 17.88 ha.

Technical regime of the land:

The land is located within the limits of Oltenita town and is regulated by the town planning documentation - PUG phase - developed and approved in 2013. The current category of use is non-productive land. The land subject to the investment is arable land.

Compliance with town planning:

The land is located within the limits of Oltenita town and is regulated by the town planning documentation - PUG phase - developed and approved in 2013, in the territorial reference unit 63. The current function of the site subject to this documentation is: activities related to the commercial port: non-polluting production units, storage and services - having a high percentage of green areas, according to the town planning documentation - PUG phase - developed and approved in 2013.

Economic regime of the land:

The land which is subject to this technical documentation is non-built-up and has no fencing. The category of use of the land is "non-productive land".

The area of the site under review is of 17.88 ha.

## ***PROPOSED SITUATION***

The beneficiary of the investment - GREEN OIL AND LUBES SRL is part of a group of companies that developed similar investments in other regions of the world (UAE, Saudi Arabia, Malaysia, South Africa) have reviewed several scenarios regarding the location of the site. In this respect, the reviewed

scenarios included at macro-regional level several countries in Central Europe and Eastern Europe. Considering the macro-economic stability of Romania in a long-term scenario, and also the possible evolution in a regional geopolitical and economic context, Romania was preferred over other countries (Bulgaria, Serbia etc.)

The consultants of the investor on finding the site for the investment took into consideration several factors, among which the most important were: available surface and the legal status of the land, road access, rail infrastructure, existing utilities in the area and possible connection to the utilities for power supply, natural gas supply, water and sewerage system existing in the area. Also an important factor was the workforce existing in the neighbouring area of the investment, the human resource being essential from this point of view. Following the review of several possible sites for the investment, the site located within the limits of Oltenita town was selected. In this respect a very important factor in selecting this location was also a possible connection - in a possible long-term scenario - to the naval transport infrastructure (both on Danube and Arges rivers).

The land proposed for the investment is located within the limits of Oltenita town and is regulated by the town planning documentation - PUG phase - developed and approved in 2013.

The land under review is located in the south area of Oltenita municipality, adjacent to two watercourses - Dunarea river and Arges river.

The land proposed for investment is located outside the built-up area of the town, at a distance of over 770 meters from the first houses, so it is unlikely to affect the residential area because of the presence of the industrial constructions and current activities.

From the point of view of access to the land subject to the investment, access will be through the national road - DN 4 - up to the area of Oltenita port (road end), then on Portului Street on a distance of approximately 970 meters (modernized road). The access to the investment will be from Portului Street on a non-modernized road of approximately 200 meters, which the beneficiary of the investments will do its best to improve. To this end, we propose that the road infrastructure should be modernized - Portului Street and access road to the property.

In a further phase, proposals will be made for the modernization of the road infrastructure, such as B-dul 1 Decembrie and Dr. Lucian Popescu Street, as well as the surrounding roads.

The investment site is located at a distance of 1000 metres from the state border between Romania and Bulgaria.

The distance from the Danube River is of 650 metres.

The distance from Arges River is greater than 300 metres.

The maximum occupancy percentage of the land (POI) with buildings will be 60%, and the rest of the area will be used for green spaces and traffic, and the maximum height will be ground floor + 4 floors (P+4).

Compliance with the legal requirement for green spaces (minimum 26 square metres/user) will be achieved through improvement of green spaces on the land with non-built-up area inside the plant under review. The local urban regulation also specifies the obligation to plant at least 1 tree for each 100 square metre of non-built-up area.

In terms of altitude in the national system of elevation Black Sea 1975 the average altitude of the land subject to the investment is approximately 18.50 - 19.00 metres. The ground is uneven as there are sharp bumps and landforms, mostly created anthropogenically - holes, mounds etc. Considering that in time such anthropogenic landforms were covered by forest vegetation grown sporadically, consisting mainly of shrubs and trees, it is impossible to create a detailed topographical plan.

The land subject to the investment is delimited by dams with an upper height limit of approximately 20 metres, both to Danube River and Arges River.

Likewise, the beneficiary submitted to the Ministry of Transport and Infrastructure the technical documentation to obtain the approval for PUZ as well as to the public institutions under its subordination - C.N. Administratia Canalelor Navigabile S.A., approval of C.N. Administratia Porturilor Dunarii Fluviale S.A. Giurgiu – approval obtained and IPTANA SA as general designer for “Improvement of Arges and Dambovitza Rive channels for navigation and other uses”.

Objective and main purpose of the project:

This Zonal Urban Plan (PUZ) proposes the change of the urban planning indicators related to the land owned by the beneficiary, according to the documents submitted for obtaining the Urban Planning Certificate, and also the current function of the site will also be amended from a commercial and tourist port to an industrial area.

The used oil recycling plant will have a processing capacity of 200 tonnes/day which requires, according to the technological flow presented by the beneficiary, an annual processing quantity of approximately 66,000 tonnes of oils. Technology will be state-of-the-art by combining advanced technology of vacuum distillation with catalytic high-pressure hydrotreatment of the recovered oil.

Overall, the plant will ensure environment protection by processing approximately 66,000 tonnes/year of hazardous and toxic waste, producing high quality lubricants.

The components of the investment are the following:



- Object 1 - Processing factory;

Comprising of the distillation installation and the hydrotreatment unit. Estimated Sizes: 20 x 15 m for each facility.

- Object 2 - utilities platform;

It includes the tanks for storing raw materials (used oil), intermediate products and the finished product.

Current no.	Description	No. of units	Capacity (m3)
1	Tank for raw material (used oil)	3	2000
2	Tank for oil base	4	1000
3	Diesel fuel tank	1	500
4	bitumen tank	2	250
5	Waste oil tank (future expansion)	1	2000
6	Caustic soda tank	1	50
7	Fuel tank	1	200
8	Tank for oil base (future extension)	2	2000

- Object 3 - Platform for loading / unloading;

Includes the access area for trucks for unloading raw material (used oil) and loading finished products. Norm capacity - tanks with a volume of 35m3. Estimated volume - 6312m3 / month (75750m3 / year), maximum traffic - 10

- Object 4 – Hydrogen plant;

Includes the H<sub>2</sub> production plant necessary in the hydrotreating process. The factory is located at a safety standard distance of minimum 10m from the plant. H<sub>2</sub> produced from water by hydrolysis. Estimated area 1054m<sup>2</sup>.

- Object 5 - pre-cleaning station;

It includes hydrocarbon separator that will treat rainwater collected from the inside roads. Estimated area - 347m<sup>2</sup>.

- Object 6 - PSI Station;

It includes household water necessary for the fire fighting equipment, including group of pumps and intangible water reserves. Estimated area - 275m<sup>2</sup>.

- Object 7 - - power connection (transformation post)

It includes the transformation point of MT / JT and the electrical connection of the objective. Estimated area - 1100m<sup>2</sup>.

- Object 8 - Control Room;

It includes the remote control unit of the plant, which will control, using a computer system, all the equipment of the objective. Estimated area - 125m<sup>2</sup>.

- Object 9 - laboratory

Includes the unit for analysis of raw materials introduced into the factory, and of the finished products resulting from the production process. Estimated area - 50m<sup>2</sup>.

- Object 10 - Cooling tower;

It includes the cooling equipment of process water circulating through the system. Estimated area - 365m<sup>2</sup>.

- Object 11 - Household water;

Includes connections to the water public network, pressurizing station and general distributor of process water. Estimated area - 6m<sup>2</sup>.

- Object 12 - maintenance workshop and storage for chemicals;

Includes the mechanical workshop necessary for the maintenance of the equipment in the factory and the storage for chemicals needed for functioning. Estimated area - 470m<sup>2</sup>.

- Object 13 - Management Building

Will accommodate the administrative staff of the objective and the changing rooms of the operational staff and the canteen of the unit. Occupied area is 450m<sup>2</sup>, the building will have three floors (GF + 2).

➤ Object 14 - inside roads;

Includes all circulations inside the interior, they will be paved roads with a minimum road width 7.00ml, connection intersections will be achieved with norm rays for heavy-duty circulation (trucks). Occupied area of circulation is estimated at approx. 1.6ha.

➤ Object 15 - fencing.

Includes the fencing of the entire enclosure the objective with metal fence with a concrete base. The total length of fencing - approx. 1100 ml.

In terms of facilities within the investment the following installations and equipment will be used:

➤ For the technological process that involves hydrotreating:

	Columns, vessels and reactors
1	Fractionation column
2	Absorber MDEA (amine)
3	MDEA Regenerator (amine)
4	Hydrotreating supply expansion vessel
5	Low-pressure separator
6	Circulation compressor for the expansion vessel
7	High pressure separator, cold
8	High pressure separator, hot
9	Supply compressor expansion vessel
10	Vacuum pump expansion vessel
11	Water injection vessel
12	Neutralizer injection vessel
13	Corrosion inhibitor injection vessel
14	Atmospheric vessel
15	Heat transfer oil tank
16	Oil expansion vessel for heat transfer
17	Liquid fuel vessel
18	MDEA absorber Supply tank
19	Regenerator reflux Vessel
20	MDEA vessel
21	Flare expansion vessel
22	Reactor
23	Reactor
24	Hydrotreatment main reactor

	Furnaces
25	Furnace
	Pumps
26	Hydrotreatment supply pumps
27	Fractionary pumps
28	Re-contracting pumps
29	Supply pump for dehydration heavy refinery streams
30	Light refinery streams pumps
31	Vacuum pumps fractioning
32	Supply pumps
33	Water injection pumps
34	Neutralizer injection pump
35	Corrosion inhibitor injection pump
36	Condensate pump vacuum
37	Heat transfer oil circulation pump
38	Heat transfer oil filling pump
39	Light amine pumps
40	Amine regenerator reboiler pumps
41	Flame pumps
	Compressors
42	Re-circulation compressor
43	Hydrogen Supply Compressor

	Heat exchanger
44	Supply exchange
45	Reactor supply heater
46	Fractioning supply heater
47	Recirculated gas cooler
48	Finished product cooler
49	Main reactor supply heater
50	Beam supply vessel
51	Light distillation fraction cooler
52	Fractional condensator

53	Hydrogen cooler
54	Hydrotreating supply reheater
55	Supply gas cooler
56	Light amines cooler
57	Amine reboiler
58	Regeneratio condenser
	Filters
59	Hydrotreatment supply filters
60	Product filters
61	Heat transfer oil filters
62	Cartridge filter
63	Active carbon filter
64	Mechanical particle filter
65	Flame
	Complete modules
66	Amine additive injection module
67	Hydrogen production unit

➤ For the technological process that involves distilation:

		Equipment type
	1057-GOAL-P-PFD-1001/01	
1	Supply tanks	Tank
2	Caustic soda storage tank	Tank
3	Self-cleaning filter	Filter
4	Raw material receiving pump	Pump
5	Raw material transfer pump	Pump
6	Caustic soda injection pump	Pump
	1057-GOAL-P-PFD-1001/02	
1	Heat recovery	Heat exchanger
2	Centrifuge	Filter
3	Daily supply tank	Tank
4	Process supply pump	Pump

	1057-GOAL-P-PFD-1002	
1	Dehydration pre-heater	Heat exchanger
2	Dehydration Evaporator	Heat exchanger
3	Water and light refinery streams condensator	Heat exchanger
4	Dehydrated oil separator	vessel
5	Condensate collection vessel	vessel
6	Dehydrated oil transfer pump	Pump
7	Water and light refinery streams condensate pump	Pump
	1057-GOAL-P-PFD-1003	
1	Liquid fuel pre-heater	Heat exchanger
2	Liquid fuel evaporator	Heat exchanger
3	Liquid fuel condensator	Heat exchanger
4	Liquid fuel separator	vessel
5	Liquid fuel collecting vessel	vessel
6	Recirculation and oil transfer pump	Pump
7	Liquid fuel transfer pump	Pump
	1057-GOAL-P-PFD-1004	
1	Supply condensator	Heat exchanger
2	Recirculated liquid cooler	Heat exchanger
3	Liquid separator	vessel
4	Discharge separator	vessel
5	Liquid transfer pump	Pump
6	Liquid circulation pump	Pump
7	Vacuum pump for the dehydration area	Pump
	1057-GOAL-P-PFD-1005/01	
1	Intermediate refinery streams pre-heater	Heat exchanger
2	Intermediate refinery streams evaporator	Heat exchanger
3	Intermediate refinery streams condensator	Heat exchanger
4	Intermediate waste separator	vessel
5	Intermediate refinery streams collection Vessel	vessel
6	Intermediate waste transfer pump	Pump
7	Intermediate refinery streams transfer pump	Pump
	1057-GOAL-P-PFD-1005/02	
1	Supply condensator-2	Heat exchanger
2	Supply condensator-3	Heat exchanger
3	Liquid separator-2	vessel
4	Liquid separator-3	vessel
5	Booster for the intermediate refinery streams recovery area	Pump

6	Wine pump for the intermediate refinery streams recovery area	Pump
7	Liquid transfer pump - 2	Pump
8	Liquid transfer pump - 3	Pump
	1057-GOAL-P-PFD-1006/1	
1	Heavy refinery streams pre-heater	Heat exchanger
2	Film evaporator 1	Heat exchanger
3	Evaporator heavy fraction condenser	Heat exchanger
4	Heavy refinery streams collecting vessel	vessel
5	Residue vessel for film evaporator	vessel
6	Transfer pump for heavy refinery streams	Pump
7	Residue transfer pump	Pump
	1057-GOAL-P-PFD-1006/2	
1	Supply condensator-4	Heat exchanger
2	Supply condensator-5	Heat exchanger
3	Circulation liquid cooler	Heat exchanger
4	Liquid separator-4	vessel
5	Liquid separator-5	vessel
6	Liquid separator-6	vessel
7	Discharge separator	vessel
8	Vacuum booster-2	Pump
9	Vacuum booster-3	Pump
10	Vacuum pump for recovery of heavy refinery streams	Pump
11	Liquid transfer pump - 4	Pump
12	Liquid transfer pump - 5	Pump
13	Liquid circulation pump	Pump
	1057-GOAL-P-PFD-1007/01	
1	Film evaporator-2	Heat exchanger
2	Evaporator heavy fraction condenser-2	Heat exchanger
3	Heavy refinery streams collecting vessel-2	vessel
4	Heavy refinery streams collecting vessel-2	vessel
5	Transfer pump for heavy refinery streams-2	Pump
6	Residue transfer pump-2	Pump
	1057-GOAL-P-PFD-1007/02	
1	Supply condensator-6	Heat exchanger
2	Supply condensator-7	Heat exchanger
3	Circulation liquid cooler-3	Heat exchanger
4	Liquid separator-7	vessel

5	Liquid separator-8	vessel
6	Liquid separator-9	vessel
7	Discharge separator	vessel
8	Vacuum booster-4	Pump
9	Vacuum booster-5	Pump
10	Vacuum pump for recovery of heavy refinery streams-2	Pump
11	Liquid transfer pump - 6	Pump
12	Liquid transfer pump - 7	Pump
13	Liquid circulation pump	Pump
	1057-GOAL-P-PFD-1008/01	
1	Film evaporator-3	Heat exchanger
2	Evaporator heavy fraction condenser-3	Heat exchanger
3	Heavy refinery streams collecting vessel-3	vessel
4	Heavy refinery streams collecting vessel-3	vessel
5	Transfer pump for heavy refinery streams-3	Pump
6	Residue transfer pump-3	Pump
	1057-GOAL-P-PFD-1008/02	
1	Supply condensator-8	Heat exchanger
2	Supply condensator-9	Heat exchanger
3	Circulation liquid cooler-4	Heat exchanger
4	Liquid separator-10	vessel
5	Liquid separator-11	vessel
6	Liquid separator-12	vessel
7	Discharge separator	vessel
8	Vacuum booster-6	Pump
9	Vacuum booster-7	Pump
10	Vacuum pump for recovery of heavy refinery streams-3	Pump
11	Liquid transfer pump - 8	Pump
12	Liquid transfer pump - 9	Pump
13	Liquid circulation pump	Pump
	1057-GOAL-P-PFD-1009/01	
1	Film evaporator-4	Heat exchanger
2	Evaporator heavy fraction condenser-4	Heat exchanger
3	Heavy refinery streams collecting vessel-4	vessel
4	Heavy refinery streams collecting vessel-4	vessel
5	Transfer pump for heavy refinery streams-4	Pump
6	Residue transfer pump-4	Pump
	1057-GOAL-P-PFD-1009/02	

1	Supply condensator-10	Heat exchanger
2	Supply condensator-11	Heat exchanger
3	Circulation liquid cooler-5	Heat exchanger
4	Liquid separator-13	vessel
5	Liquid separator-14	vessel
6	Liquid separator-15	vessel
7	Discharge separator	vessel
8	Vacuum booster-8	Pump
9	Vacuum booster-9	Pump
10	Vacuum pump for recovery of heavy refinery streams-4	Pump
11	Liquid transfer pump - 10	Pump
12	Liquid transfer pump - 11	Pump
13	Liquid circulation pump	Pump
	1057-GOAL-P-PFD-1010	
1	Pre-heater for stripping	Heat exchanger
2	Oil separator	vessels
3	Liquid fuel recovery vessel	vessels
4	Waste water recovery vessel	vessels
5	Wastewater stripping column	Column
6	Liquid fuel transfer pump	Pump
7	Wastewater intermediate transfer pump	Pump
8	Wastewater transfer pump	Pump
9	Wastewater cooler	Heat exchanger

Description of the technological flow:

In this chapter, the technological process of installations is explained, and the effluents of each step of the process are described, along with the methods applied.

#### a. Dehydration

Dehydration is obtained by heating the oil used in a specialized equipment. This process results in 3,986 tonnes/year of vapours, consisting of a mixture of steam and volatile components. Water is then condensed and sent to the collection system of chemically impure waters. The volatile components are used as fuel gs with low calorific power in the furnace of the facility or burnt in the flare.

- ✚ Intake: 66,666 tonnes/year of used oil
- ✚ Utilities: heat in the form of recirculated hot oil and cooling water
- ✚ Products: 62,680 tonnes/year of dehydrated used oil, 3,986 tonnes/year of wastewater

#### b. Separation of liquid fuel (diesel oil)

The system consists of a vacuum evaporator. A quantity of 6,680 tonnes/year of fuel will be extracted from the used oil. This will be used in the furnace, but it will also supply the hydrotreater.

- ✚ Intake: 62,680 tonnes/year of used dehydrated oils.
- ✚ Utilities: heat in the form of hot recycled oil and cooling water
- ✚ Products: 56,000 tonnes/year supply of film evaporator, 6,680 tonnes/year of liquid fuel

#### c. Oil separation

The basic product of the fuel separator will supply the film evaporators (Falling Film Evaporator & Wiped Film Evaporator). The separation will be carried out under vacuum.

The residue (bitumen) from the film evaporator, 9,320 tonnes/year, will be sold as road bitumen.

- ✚ Intake: 56,000 tonnes/year
- ✚ Utilities: heat in the form of hot recycled oil and cooling water
- ✚ Products: 46,680 tonnes/year from film evaporators, 9,320 tonnes/year of bitumen

#### d. Hydrotreatment

The oil recovered from the film evaporators is treated with hydrogen in this facility to produce high quality base oils. The oil resulting from evaporators are treated in the presence of a special catalyst at a temperature of 360°C and pressure of 96 bar. The main resulting product is the oil base. The sulphur present in the raw material is extracted in the form of hydrogen sulfide (H<sub>2</sub>S). It will be extracted from the hydrogen flow by means of the amine absorption facility. A part of the recirculated hydrogen flow will be burnt as fuel in the furnace to keep the concentration of light hydrocarbons at the desired level.

- ✚ Products: 46,680 tonnes/year from the film evaporators, 3,624 tonnes/year of hydrogen
- ✚ Utilities: heat in the form of recirculated hot oil and cooling water
- ✚ Products: 45,624 tonnes/year of hydrotreated base oils, 680 tonnes/year of hydrogen-rich gases, used as fuel in the furnace.

#### e. Final fractionation

The hydrotreated oil is fractionated in the vacuum distillation column to produce base oils SN-150 or SN-500. In the same fractionation column light refinery streams are extracted to comply with the specifications of the products SN-150 and SN-500.

#### f. Hydrogen plant

The hydrogen required for the hydrotreatment plant is produced by the electrolysis of water. Oxygen will be released in the air.

- ✚ Intake: 4,285 tonnes/year of demineralized water.
- ✚ Utilities: electricity, cooling water
- ✚ Products: 360 tonnes/year of hydrogen

g. Amine absorption facility

The mixture of hydrogen-rich gases, produced in the hydrotreater, also contains H<sub>2</sub>S. The gas is sent to the amines absorption plant for the removal of H<sub>2</sub>S. The hydrogen-rich mixture of filtrated gas is recirculated in the hydrotreater while H<sub>2</sub>S is burnt in the furnace or in the flare. The maximum quantity of H<sub>2</sub>S is 24 kg/h (192 tonnes/year).

## ENVIRONMENT PROTECTION MEASURES

BAT References (Best Available Technologies)

Technologies adopted for this installation are the most advanced included in the document:

INTEGRATED POLLUTION PREVENTION and CONTROL (IPPC)

The reference document on best available techniques for the waste treatment industries, August 2006 - European Commission

The references are the following:

Distillation - used to remove water and liquid fuel and decomposition of compounds containing heavy metals (Chapter 4, page 88)

Film evaporators - for recovery of oil refinery streams and removal of heavy metals in asphalt waste (chapter 4.4.1.6, page 415)

Hydrotreatment - used to improve the base oils (chapter 4.4.1.9, page 416)

Absorption of amines - amine absorption facility is integrated into the hydrotreating plant to treat the gases rich in hydrogen sulfide (chapter 4.4.1.9, page 417).

Treatment of resulting gases - they are incinerated in technological furnace (chapter 4.6.14, page 473)

Wastewater treatment - Treatment of water consists in separation of hydrocarbons, filtration of solids and biological treatment (chapter 4.7, page 488)

Vacuum generation - is produced with vacuum pumps (oil ring), not with ejectors. The generation of additional wastewater, difficult to be treated and dangerous for the environment, will be avoided (chapter 4.4.1.1, page 411)

## Emissions

There is a programme of prevention and detection of gas leaks in the plant.

The pumps will be equipped with seals that prevent leakage

The valves will be equipped with seals that prevent losses

- ✚ All safety valves will discharge to the flare system.
- ✚ Compressors will be equipped with the most modern seals that prevent leaks.
- ✚ The flanges within the hydrotreater will be RTJ, which are the safest in terms of leakage.
- ✚ The tanks for light products will be equipped with breather valves (instead of atmospheric vents).
- ✚ The valves of the tanks and the non-condensable gases will be sent to the flare.
- ✚ Chemically impure water will be stripped for H<sub>2</sub>S elimination, and then sent to the flare.
- ✚ All burners will be NO<sub>x</sub> reduced burners.

The main effluent is hydrogen sulfide (H<sub>2</sub>S) which will be produced in the hydrotreater. Quantity is very low, under 24 kg/h. This will be absorbed by the amine plant, and then will be sent to the burner of the furnace or flare. The use of MDEA amines is compatible with BAT - according to the previous paragraph.

The heat generated by the furnace where hot oil is heated (medium heat) will be generated by 1,188 tonnes/year of gas produced in the hydrotreater, completed by 3,212 tonnes/year of natural gas.

There will be two sources of air pollution, namely the technological furnace and the flare. The emissions will be as follows:

- ✚ NO<sub>x</sub>: (0.4kg/h) low NO<sub>x</sub> burners (John Zink, ZEECO or equivalent).
- ✚ CO: (0.3kg/h) low using modern burners.
- ✚ CO<sub>2</sub>: (1000kg/h)
- ✚ SO<sub>2</sub>: (35kg/h)

The plant will mainly use demineralized water. The necessary quantity of steam is very low, mainly for cleaning the equipment when stopping. The vacuum pumps do not require steam like conventional ejectors, using state-of-the-art technology in the field.

The cooling will be provided by a recycled water cooled in a cooling tower. Any leakage of oil products will not affect the groundwater as there is a closed circuit.

All liquid effluents will be treated in the wastewater treatment plant, which contains the separation of hydrocarbons, chemical and biological treatment.

The reactors in the hydrotreater require the replacement of the catalyst every 6 months. These catalysts will not contaminate the environment, but will be sent to the original provider for regeneration and recycling.

Overall, the plant will ensure environment protection by processing approximately 66,000 tonnes/year of hazardous and toxic waste, producing high quality lubricants.

Noise pollution: all equipment will be purchased in compliance with the standards imposed by the international regulations (EEMUA 140 & 141, OSHA, IEC 651/225/942) (Chapter 4, page 364).

### **Drinking water supply**

Water supply will be made from the public network of the municipality of Oltenita, network administered by SC Ecoaqua S.A.

Having regard to the specialized opinion, the flow provided by the issuer of the opinion can service the investment. Additionally the recipient drafted the "preliminary hydro-geological study for water supply from the underground of The waste oil recycling factory situated in the south of Oltenita".

### **Sewage and wastewater treatment**

The domestic sewage together with the water resulting from the sanitation of the premises and the rinsing of the containers (from the laboratory) will be discharged through a R1 connection into the public sewerage system of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA.

The domestic sewage resulting from the dish washing (from the canteen) will pass through a fat separator after being discharged together with sewage water and water used for sanitation of the premises into the public sewerage system.

The wastewater resulting from the gas stripping and oil dehydration will pass through a treatment plant before being discharged into the public sewerage system.

Once a year, the water used for cooling the plant will also be discharged. Before discharging into the public sewerage system, the wastewater will pass through the treatment plant.

Rainwater will pass through an oil separator and discharged into the public sewerage network through the R2 connection.

### **Gas supply**

The natural gases will be supplied by connecting to the existing distribution network in the area, network managed by WIROM GAS SA.

### **Power supply**

Electrical installations of an investment will ensure power supply, regular and safety lighting installation, installation of low current and against accidental contact voltage protection and against lightning surges. The electricity will be provided by connecting it to the existing distribution network in the ENEL DISTRIBUTION DOBROGEA area.

### ***Alternatives considered***

- *Zero alternative or maintaining the current situation*

➤ *Presented version*

### **"ZERO" ALTERNATIVE OR "NO ACTION"**

The "zero" alternative was considered to provide a reference against other alternatives for various elements of the project that is the subject to the PUZ analyzed.

The main impacts associated with adopting "zero" alternative are:

- loss of major job opportunities;
- loss of investments made to date, resulting in loss of interest of the private investors, commercial banks and international financing institutions on future industrial development projects in the region and in Romania;
- loss of support for the development of a modern installation, consistent with the regulations in the field of reducing the amount of waste nationwide - recycling the used oil);

The most favorable situation for the area would be:

- dispose of solid economic opportunities and jobs;
- The environmental and social impact generated by the activity that will be developed and other major economic developments to be minimal;
- to have the capacity and technical resources necessary to remedy the occurrence of pollution.

To accomplish this (and prevent the negative social - economic impact generated by the failure to implement the project) requires a viable economic resource, capable of generating opportunities for jobs in significant numbers and sufficient income to enable solving environmental problems

In those below is presented a comparison of the forms of environmental impact corresponding to the "zero" alternative with the implementation of the project.

### **ALTERNATIVES REGARDING THE DEVELOPMENT OF THE PROJECT**

**The proposed version** leads to the following advantages:

- the existing roads will be modernized;
- new jobs will be generated;
- expansion of the town water collection and water distribution network
- achieving of a sewage system that provides routing of the wastewater to the treatment plant;
- will develop the power supply network to ensure a high degree of reliability and quality exploitation;
- applying a modern and efficient waste management system;
- introduction of new sorting systems at source and selective collection of recyclable materials.

for this plan, the following has been considered

- ✓ *Economic* criteria (namely the efficiency). The proposed solution for P.U.Z. shows the best results in terms of cost, lower compared to other alternatives; similarly, the maintenance costs are lower.

- ✓ *Social criteria* (namely the social acceptability). The P.U.Z. proposals show the best results in terms of protection of the human factor; positive impact on the residents is significant.
- ✓ *Environment criteria* (namely the environmental sustainability). The P.U.Z. proposals show insignificant effects on biodiversity, which is developed in appropriate assessment study which was approved by the EPA Calarasi. It is true that at first glance is an act of courage to build a factory for recycling used oil in close proximity of Natura 2000 site, but the environmental monitoring conducted have shown that no priority habitats exist in the area, so it does not destroy habitats, the bird species identified are not resident on site and were observed only in passage, most processes will be closed circuit. The investment brings environmental benefits by creating a refinery that will reduce the amount of waste of used oil nationwide. Through a strict monitoring program or there will be no significant adverse environmental effects.

The proposals for the works designed from the P.U.Z. meet the technical norms in force. No other version of the design would have provided further environmental benefits compared with the chosen version.

The building materials will include simple materials generally used in such works. It is anticipated that traditional building materials and techniques will be used, although the final details depend on the manufacturer's technology. The technical solutions later proposed will have to take into account:

- the environmental conditions,
- type and nature of the work,
- the possibility of using local materials,
- technical, functional usefulness, and the security of the proposed development,
- the facilities, the functional, geological, hydrogeological, hydrological, institutional characteristics of the area,
- the existing vicinities.

Through the specifications the manufacturer is recommended the use of modern equipment and machinery to comply with the technical requirements and the current European standards practiced in environmental protection. A recommendation will be made where the work spaces are limited to use mainly manual work to minimize the impact of the construction works.

### 1.3. Relationship with other relevant plans and programs

Zonal Urban Plan is consistent with the landscaping plans in Romania. Among significant documents we mention:

- "Green Charter" on regional development policy in Romania, developed by the Romanian Government and the European Commission
- National Landscape Development Plan - Sections I-IV

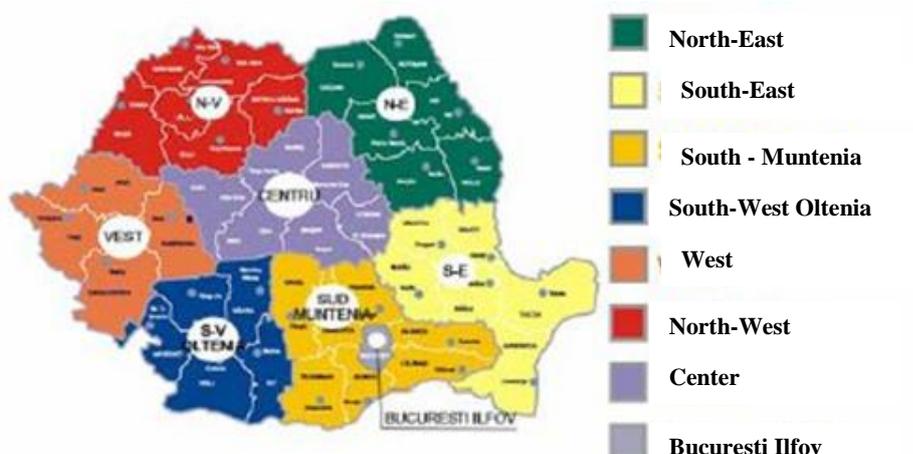
The Zonal urban plan is consistent with the following programs:

**PDR – Development Plan for the South - Muntenia Region 2007 - 2013** (see **figure 1.1**) which aims at economic and social regeneration of the region.

The strategic objectives to implement PRD are:

2. Increasing the competitiveness and attractiveness of the region,

3. Increasing the innovative capacity and competitiveness of the business environment in the region,
4. Sustainable and balanced economic, social, and cultural of the rural communities,
5. Increasing the social stability and efficiency of the work potential of the region



**Figure 1.1 Development Region South-Muntenia**

**Source: MDRL**

The development plan will be implemented based on the following key priorities, which constitute the "conductors of change" that are geared toward the specific development needs of the region:

- **Priority 1** – the local and regional infrastructure development, with the objective of providing physical conditions for an economy and a modern way of life. It establishes the following measures:
  - Development and modernization of transport and port infrastructure, including the infrastructure and its support activities,
  - Ecological reconstruction of degraded areas and protection of the natural heritage;
  
- **Priority 2** – business development by providing a favorable environment for improving the economic performance of the region. Establishes the following measures:
  - Development of business infrastructure,
  - Stimulating the establishment of new SMEs and increase the competitiveness of the existing ones,
  - Stimulating private sector investment in the region economy,
  - Increasing the support and consulting services for SMEs,
  - Promoting internal and international cooperation.
  
- **Priority 3** – Efficient agriculture and rural development aimed at increasing the participation of rural communities and of the agriculture in the region economy;
  - Diversification and development of agriculture and food sector,
  - Developing and improving the infrastructure to support agriculture,
  - Improving the processing and marketing of agricultural products,
  - Development of specific services sector focused on rural areas;
  
- **Priority 4** – human resource development, by providing flexible, capable and modern human resources, necessary to sustain the social development and sustainable economy.

- Continuous adaptation and structuring of the educational and professional training system in line with labor market needs,
  - Adaptability of the workforce and business development,
  - Active employment policies,
  - Promoting development and social inclusion.
- 
- **PRAM – Regional Environmental Action Plan** – of ARPM Pitesti is part of the "*Program of Action for the Environment for Central and Eastern Europe*" adopted at the Ministerial Conference "Environment for Europe" held in 1993 in Lucerne, Switzerland, framework document which is "a basis for the action of governments and local administrations, the Commission of the European Communities, and international organizations, financial institutions and private investors in the region" which establishes the following objectives:
    - Improving environmental conditions in the community by implementing concrete action strategies, efficient in terms of costs,
    - Promoting public awareness of responsibilities in the field of environmental protection and increasing public support for strategies and investments needed for the action,
    - Strengthening the capacity of local authorities and NGOs in the management and implementation of environmental programs, including their ability in obtaining financing from national and international institutions, as well as from sponsors,
    - Promoting the partnership between citizens, local authorities, NGOs, scientists and businessmen, as well as learning how to work together in solving problems of the community,
    - Identification, evaluation and establishing environment priorities for which it is necessary to act based on the values of the community and scientific data,
    - Developing a Regional Action Plan for Environmental Protection to identify specific actions for solving problems and promoting community vision,
    - Meeting the requirements arising from national legislation and regulations in developing the Regional Action Plan for Environmental Protection.
    - The Regional Environmental Action Plan promotes the idea of partnership in solving environmental problems by bringing in the organizational structure of the regional authorities as well as

The purpose of PRAM is the clear assessment of environmental issues, setting priorities for action in the short, medium and long term, establishing the correlation of economic development contained in the regional development plan with environmental protection issues. The environmental issues which are solved in the Southeast Region are identified by these aspects:

- Have the greatest impact - affecting a large number of persons in the most important directions;
- Are the most central - affect as many problems as possible;
- Are the most urgent - can cause additional problems if not resolved;
- Correspond to the highest degree to the common values of the community.

The main goals of PRAM are:

- Identifying and prioritizing the environmental problems / aspects depending on the effects they have on the environment,
- Transforming the priority environmental problems / issues into actions to be undertaken by the parties involved.
- To optimize access to the Structural Funds.
-

In the studied area there are programs approved locally with which the objective can be connected (P.U.Z., P.U.G.): PUG Municipality of Oltenita approved in 2013 and ongoing is the "Organization of Arges and Dambovitza rivers for navigation and other uses" beneficiary SC IPTANA SA, project that unfolds on an area of 64.4 ha, representing a percentage of 1.06% of the Danube-Oltenita ROSPA0038 site.

The cumulative impact of the developing projects with the plan in the evaluation procedure can only exist during the construction through the noise and emissions from machinery from the work sites. After completion of work the cumulative impact is 0 and does not affect protected natural area.

## **2. RELEVANT MATTERS OF THE CURRENT STATUS OF THE ENVIRONMENT AND ITS LIKELY EVOLUTION IN CASE THE PLAN OR THE PROPOSED PROGRAM IS NOT IMPLEMENTED**

### **2.1. The relevant aspects of the current state of the environment**

The site under review, is located in the proximity of the European ecological network Natura 2000, on the site of Community importance RO SPA 0038 - Danube - Oltenita.

The area proposed for building the waste oil refining plant is located in a floodplain area warbler type. The characteristic habitat is of arable farmland and shrub vegetation.

The habitats presented in the studied site are included in Natura 2000 standard form at the status Conservation status: C - medium or low conservation.

Taking into consideration the preservation degree of the structures and the functions of the habitat type, as well as the possibilities of recovery can be considered that in the studied area the site has structure average /partially degraded.

The species listed in Annex II to Directive 92/43 / EEC of the site from the point of view of conservation of the habitat features that are important for the species concerned and possibilities of restoring fits in: C - average or reduced conservation

Currently the area is very anthropic, no protected resident species have been identified.

### **2.2. Relevant matters of the likely evolution of the environment and the economic and social situation in case the plan proposed is not implemented**

The main impacts associated with not adopting the project are:

- loss of major job opportunities;
- loss of investments made to date, resulting in loss of interest of the private investors, commercial banks and international financing institutions on future industrial development projects in the region and in Romania;

- loss of support for the development of a modern installation, consistent with the regulations in the field of reducing the amount of waste nationwide - recycling the used oil);

The most favorable situation for the area would be:

- dispose of solid economic opportunities and jobs;
- The environmental and social impact generated by the activity that will be developed and other major economic developments to be minimal;
- to have the capacity and technical resources necessary to remedy the occurrence of pollution.

To accomplish this (and prevent the negative social - economic impact generated by the failure to implement the project) requires a viable economic resource, capable of generating opportunities for jobs in significant numbers and sufficient income to enable solving environmental problems

### **3. ENVIRONMENT CHARACTERISTICS OF THE AREA LIKELY TO BE SIGNIFICANTLY AFFECTED**

#### **3.1. Description of the natural conditions**

##### *Relief*

Oltenita municipality, is situated in the Danube Meadow, near km 430 downstream of the confluence of Danube with the Arges river. The town administratively belongs to Calarasi county, being the second city in number of inhabitants, economic - social and cultural activity after the municipality of Calarasi.

##### *The soils*

A characteristic of of the county is represented by the fact that on an area that is not very large the following strips of soil succeed on the East-West direction: argillic chernozioms (they are suited, with good results, for vegetable crops, pastures, etc.) and typical reddish brown soils, the latter on small areas in the extreme west of the county. These regional soils were turned in or loess or loesside deposits, their surface texture being predominantly average. The soil and relief favorable conditions explain the region's predominant grain characteristic.

In the studied area construction never existed before.

##### *Hydrogeology*

The hydrographic network is totally tributary of the Danube River, which separates the south and southeast of the county. Besides the Arges and Dambovita rivers, which by their lower sectors drains the south-east of the county, other, less important streams, belong to the local network. Among these: Mostistea with the sources in Ialomita county, and the Barza-Galatui system. Note that in the north-east of the county, the hydrographic network is virtually nil, the only water surface in this area is Lake Jegalia. The Danube waters the county over a distance of 154 Km upstream of Cascioarele up to the Fetesti-Cernavoda railway in Balta Borcea. At the Chiciu border crossing point (located at a distance of 8 km upstream of Calarasi), the Danube separates into two arms: Borcea, on the left, and Old Danube, on the right, bounding Calarasi County of Constanta county.

On the left bank of Borcea an industrial canal was made (10 km long) arranged to allow barges loaded with raw materials to reach S.C. Donasid S.A.. A mining port was built with facilities for loading / unloading berths and river vessels docking. The canal is crossed by a modern bridge (4 lanes) that connects the town to the Danube crossing point from Chiciu-Ostrov (Constanta county), also being an excellent place for fishing and water sports training. Between the two arms that enclose Borcea Everglade, there is a direct connection through Bala arm, which plays an important role in terms of flow distribution on the two arms. The annual average flow of the river is 5470 m<sup>3</sup> / s at the entrance to the county. Arges river enters the near the village of Budesti and flows into the Danube upstream of Oltenita, crossing Calarasi Calarasi over a length of 37 Km. The annual average flow is small at the entrance to the county (56 cm /s) and grows sensitively at the inflow (73 cm / s) as a result of the contribution of the Dambovita River. Regarding the lakes, Calarasi county has man-made lakes, a lot of ponds, mostly in the Mostistei valley and its tributaries: Rasa, Luica, Zboil, Barza and Pasarea. From the natural lakes we must, firstly mention, along the Danube river limans: Mostiștea, Gălățui and Potcoava. The meadow lakes are represented here by Boianu and Ceacu in the Danube meadow, Mitreni in the Arges meadow, and Tatar i the Dambovita meadow.

### *Climate*

The climate is oceanic temperate and continental temperate, with rare continental and tropical tropical marine air intrusions, and also arctic air intrusions. The climate is characterized by very hot summers, with not too rich rainfalls, and relatively cold winters, sometimes marked by strong storms, and frequent periods of warming, that cause temporary discomfort in the territorial distribution of snow. The annual average temperature is 11.35 ° C, the absolute maximums so far recorded in the Calarasi county reached 44.0 ° C in Argovei Valley and to 41.1 ° C in Calarasi. The absolute minimum was registered in Calarasi (-30.0 ° C) on January 9, 1938. Regarding the rainfalls, the annual average quantities total 540,2mm in Oltenita and 503,6mm in Calarasi. The most part of the rainfalls is during the warm semester (April 15-October 15), when showers accompanied by lightning are very common. Because of the uniform relief, specific lowland area, the prevailing winds in the Calarasi county are those that blow from the north and north-east, as well as the west and southwest, the best known being the first category, Crivatul and Austral, and Bălărețul from the second category.

### *Biodiversity*

The site under review, is located at a distance of 7 m from the site of Community importance RO SPA 0038 - Danube - Oltenita.

The ROSPA0038 Danube-Oltenita site is located on the Danube between km 451 and km 430, in the southern part of Romania, in the floodplain of the Danube.

It includes both the portion of the Danube between Greaca, Căscioarele, Oltenița and agricultural land that is part of the area within the dam Greek-Arges-Chirnogi. The geographic coordinates are 26o 29' 4" East longitude 44o 3' 48" North latitude. It stretches on a surface of 6022 hectares. The average altitude of the territory in the eastern part of the site is located the Oltenița city, by the bank of the river Arges, which is included in the site.

The northern part of the site can be accessed from the town of Chirnogi located on DN41 - Oltenița-Giurgiu- following local roads to the Danube river bank. Access can be done on the Danube, upstream from Oltenița. The site is located administratively in the municipalities of Prundu - Giurgiu County, Chirnogi, Oltenița city, Calarasi County.

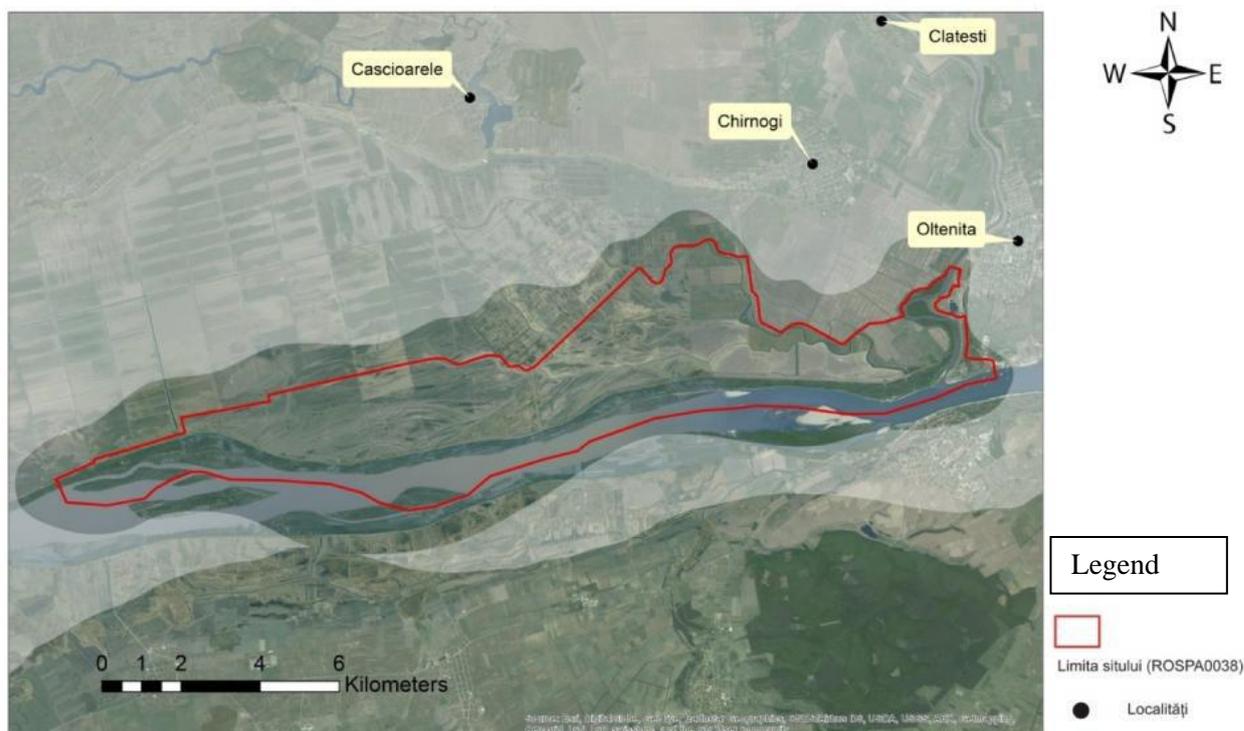
The purpose of the ROSPA0038 Danube-Oltenița Site is the conservation of wild bird species existing in its perimeter, maintenance/restoration of a favorable conservation status of the bird species of community interest and their specific habitats.

The Special Protection Area ROSPA0038 Danube-Oltenița - hereinafter referred to as site ROSPA0038 Danube-Oltenița - is a protected natural area of Community interest - the category of a special protection area under Directive 2009/147 / EC of the European Parliament and of the Council of 2009 on the conservation of wild birds designated by Government Decision no. 1284 / 2007, declaring special protection areas for birds as part of the European ecological network Natura 2000 in Romania, as amended and supplemented by Government Decision no. 971/2011.

The ROSPA 0038 Danube-Oltenița site falls into category IV of management, areas for species and habitat management.

The ROSPA 0038 Danube Oltenița site partially overlaps with the protection site of community interest ROSCI0088 Gura Vedei-Saica-Slobozia.

Near the Danube Oltenița ROSPA 0038 site are located the following areas of bird protection: Oltenita-Ulmeni ROSPA0136, Comana ROSPA0022, Ostrovu Lung - Gostinu ROSPA0090, Vedeã Dunãre ROSPA0108, Oltenita –Mostistea-Chiciu ROSCI0131.



### 3.2. The environment component quality from the area likely to be significantly affected

#### Water - Factor of environment

##### *Construction period*

Drinking water supply during the site management will be provided from external sources: bottled water.

In the construction period:

- Excavations for foundations and preparing reinforcement does not involve the use of water of generating waste water;
- Preparation of technological platforms and access roads does not require the use of water;
- Concrete that requires process water is produced in the nearest concrete mixing factory and transported to the place of casting using proper equipment.

During the site organization, the staff will provide ecologic toilets for the site personnel, which will be emptied either by specialized firms or by the firm that rented them, on contract basis.

The construction - installation activities do not generate waste or polluted waters.

### *Operating period*

Water supply will be made from the public network of SC ECOAQUA SA CALARASI OLTENITA BRANCH through two connections.

The water in the public network will be used:

- for hygiene and sanitary purposes by the employees of the company
- technologically (steam generation, cooling facility (water which is recycled)
- at the laboratory (for rinsing the containers used in the lab)
- sanitation of the premises (toilets and canteen - kitchen)
- for cooking and dish washing - a canteen is planned to be arranged only for the employees of the company
- for providing the fire fighting equipment - a reservoir for water supply of the fire hydrants is provided, if necessary.

The plant will mainly use demineralized water. The necessary quantity of steam is very low, mainly for cleaning the equipment when stopping. The vacuum pumps do not require steam like conventional ejectors, using state-of-the-art technology.

The cooling will be provided by a recycled water system with water cooled in a cooling tower. Any leakage of oil products will not affect the groundwater as there is a closed circuit.

The following categories of waster water will result on site:

- sewage water
- water used for sanitation of the premises
- from dish washing
- from the laboratory (from rinsing of containers)
- from gas stripping
- from oil dehydration

The water used within the plant will pass through a softening/demineralization facility before use.

The domestic sewage together with the water resulting from the sanitation of the premises and the rinsing of the containers (from the laboratory) will be discharged through a R1 connection into the public sewerage system of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA.

The domestic sewage resulting from the dish washing (from the canteen) will pass through a fat separator after being discharged together with sewage water and water used for sanitation of the premises into the public sewerage system.

The wastewater resulting from the gas stripping and oil dehydration will pass through a treatment plant before being discharged into the public sewerage system.

Once a year, the water used for cooling the plant will also be discharged. Before discharging into the public sewerage system, the wastewater will pass through the treatment plant.

All liquid effluents will be treated in the wastewater treatment plant, which contains the separation of hydrocarbons, chemical and biological treatment.

Rainwater will pass through an oil separator and discharged into the public sewerage network through the R2 connection.

*Concentrations and mass flows of water pollutants evacuated in the environment*

**Table - Quality indicators**

<i>Indicator</i>	<i>M</i> <i>U</i>	<i>Accepted limit value</i>  <i>N.T.P.A.</i> <i>002/2002</i>	<i>Alert threshold</i>  <i>Order no.</i> <i>756/97</i>
Biochemical consumption of oxygen every 5 days (CBO <sub>5</sub> )	mgO <sub>2</sub> /l	300	210
Biochemical consumption of oxygen (CCO-Cr)	gO <sub>2</sub> /l <sup>m</sup>	500	350
Matter in suspension	mg/l	350	245
Nitrogen ammonia (NH <sub>4</sub> <sup>+</sup> )	mg/l	30	21
Phosphorus total (P)	mg/l	5	3,5

Water pollution sources during the construction period are mobile sources, diffuse sources and random sources, pollutants consisting of petroleum products leaking from transport and construction machinery, plus technological losses in transportation and at casting the concrete for platforms.

In evaluating these losses of water polluting substances the following activities were taken into consideration:

- transport of materials to build access roads and technological platforms;
- transport of concrete for foundations;
- transport of metallic confections, plant and workers in the work place.

**Accidental losses of fuel** from plant used in the execution of designed works can be estimated taking into account the following hypotheses:

- average transport distance and number of crosses to location
- average fuel consumption about 25 l/100 km;
- percentage of losses about 1‰.

**Accidental losses of cement** from concrete poured for the execution of foundations can be estimated taking into account the following hypotheses:

- quantity of cement used for 1 cubic meter of concrete = 250 kg;
- percentage of losses about 1 ‰.

The fecal and waste water will be collected in ecologic toilets and emptied periodically by a specialized unit in the area. In these conditions it is expected that these used waters do not represent polluting sources in the area.

*The manner of minimizing the impact on water*

The works at the oil refinery factory are construction - installation works with precise staging, respectively:

- development of access roads and their maintenance;
- vegetation clearing;
- development of storage - sorting platforms and their maintenance;
- location of platforms for utilities on the premises (offices, warehouse of materials, fuels storage, etc.).
- development of warehouses

Works do not require a large number of workers.

Ecologic toilets and garbage bins will be provided for domestic waste.

Water supply is provided by bottled water.

The construction activities mentioned do not generate significant amounts of waste or waste water, so no measures were provided for water protection against potential pollution with oil products or materials in suspension caused by accidental loss during the works execution.

In conclusion, the works do not result in significant pollution of the natural hydrographic network and groundwater.

Consequently, wastewater treatment and pre-treatment plants are not necessary, only the organization measures are sufficient, namely:

- consequently, handling of fuels will be made so as to avoid spills and scattering them on the ground, and the supply of transport means will be made only in the petroleum products stations;
- handling of materials, earth and other substances used, so as to avoid their displacement and movement by precipitation waters;
- eliminating technological waste as the appear.

During the operation of designed works no protective measures for water environmental factor are provided, which is unaffected by the operation of the objective. The domestic sewage resulting from the dish washing (from the canteen) will pass through a fat separator after being discharged together with sewage water and water used for sanitation of the premises into the public sewerage system.

The wastewater resulting from the gas stripping and oil dehydration will pass through a treatment plant before being discharged into the public sewerage system.

Once a year, the water used for cooling the plant will also be discharged. Before discharging into the public sewerage system, the wastewater will pass through the treatment plant.

The unit will conclude a contract for water and sewerage supply with SC Ecoaqua SA Calarasi for water supply of the objective and for discharging wastewater to public sewers.

### *Air - Factor of environment*

Construction period

The sources specific for the operating and processing site are:

- Ground level sources.

- Intermittent sources
- Their existence is strictly limited to the operating period of the site.
- They are not controllable within the meaning of O.M. 462 / 93.

The emission of pollutants is due to discharge of the gas generated by the operation of the engines fitted to work machinery and transport, and drafts which involve particles in suspension.

The characteristic pollutants for this stage are specific for construction works namely: particles in suspension and exhaust gas.

The emission factors estimated according to the methodology AP-42 used in MAPM, with the help of which the mass flows of settling and suspension particles are determined

in a percentage of about 95%, evacuated into the atmosphere following the execution activity are:

Plant - Emission (kg/h)

Bulldozer - 0.75

Excavator - 0.75

front loader 0,75

Motor grader - 0.60

Dump Truck 0.60

The emissions of suspension powders are the highest in the construction stages. Also, the particulate emissions grow in hot periods and prolonged drought.

Reducing the quantity of particulate matter can be done through the use of protective screens (screens) that reduces the wind speed in the area of the objective and by regular wetting of the work surfaces and connection surfaces from inside of the site.

Calculation of mass flow of pollutants discharged as exhaust from equipment under maximum activity was done with a combined AP-42 Corinair- Copert methodology.

The results are the following:

Pollutant Emission(g/h)

NO<sub>x</sub> (as NO<sub>2</sub>) 38,5

CO 26,8

COV<sub>mm</sub> 32,6

Particles 18,4

SO<sub>x</sub> (as SO<sub>2</sub>) 2,83

Reducing the quantities of pollutants from compression-ignition engines fitted to work machinery and transportation is done by proper adjustment.

For the machines that operate only on the site, it is necessary to regularly check and adjust the supply circuits and the exhaust circuits for compliance with the law on air quality conditions in the protected areas.

For dump trucks, car trailers and other transport equipment running and on public roads, verification and adjustment the exhaust is an obligation imposed by the legislation on public roads.

For proper adjustments, the emissions from transport vehicles inside the site are higher due to idling, cruising, very slowly driving, interrupted frequently by various obstacles, the rearing and driving in the ramp.

To assess the quantities of pollutants exhausted were taken into account the specific elements such as engine type, with or without a catalyst, type of fuel used, the size of the ramps, run time, duration of idle time and the idle time with revving engine.

All these elements contribute to the quantum of the level of pollutants and requires a thorough analysis of the actual situation.

The emissions of pollutants in the atmosphere are subject to dispersion phenomena, phenomena taking place simultaneously with the exhaust ones.

In general, the air movement in the earth's surface layer is characterized by turbulent transport of air masses.

The interaction of air masses in the earth's surface at any point results in the emergence of three components of movement which varies randomly and continuously in time.

The fluctuation is the is the motor of the phenomenon boosted by the turbulence which occurs both horizontally and vertically.

The dispersion of pollutants in the air in the area of maximum influence as well as the qualitative changes occurred or which can be registered in air quality have been interpreted by mathematical modeling using a Gaussian model.

The model uses the following data: emissions of pollutants - the amount of pollutant discharged in the time unit, the height of the exhaust, gas velocity and temperature, and meteorological factors - wind speed, degree of thermal stratification of the atmosphere.

Limit values (LV) and benchmark values (BV) established by the EU directives

#### NOX

- VL = 200  $\mu\text{g}/\text{m}^3$  for  $t < 1\text{h}$
- VR = 135  $\mu\text{g}/\text{m}^3$  for  $t < 1\text{h}$

The values of the concentration above are applied a percentage of 98% and the following values are obtained:

- VL = 40  $\mu\text{g}/\text{m}^3$  for  $t = 1\text{ year}$
- VR = 30  $\mu\text{g}/\text{m}^3$  for  $t = 1\text{ year}$  - for the protection of sensitive ecosystems in

undeveloped areas.

#### CO

- VL = 100,000  $\mu\text{g}/\text{m}^3 = 8\text{ h}$

#### SO2

- VL = 80-120  $\mu\text{g}/\text{m}^3$  - multi-annual daily average values measured

associated with the average of the multi-annual daily values measured for particles materials  $> 40\ \mu\text{g}/\text{m}^3$  and respectively  $< 40\ \mu\text{g}/\text{m}^3$

VR = 100 – 150  $\mu\text{g}/\text{m}^3$  for  $t = 24\text{ ore}$

VR = 40-60  $\mu\text{g}/\text{m}^3$  for  $t = 1$  an

VL = 350  $\mu\text{g}/\text{m}^3$  for a percentage of 98% for the data series with  $t < 1\text{h}$

associated with  $< 150 \mu\text{g} / \text{m}^3$  for particulate

LV = 250  $\mu\text{g}/\text{m}^3$ -98 value for  $t < 1\text{h}$ , associated with  $t < 150 \mu\text{g}/\text{m}^3$  for

particles

LV = 125  $\mu\text{g}/\text{m}^3$  for  $t = 24$  h

LV = 20  $\mu\text{g}/\text{m}^3$  for  $t = 24$  h

LV = 10 – 15  $\mu\text{g}/\text{m}^3$  for  $t = 1$  year

Pb

0,5 p,g/m<sup>3</sup> for  $t = 1$  year

Total material particles (gravimetry)

LV = 80  $\mu\text{g}/\text{m}^3$  daily mean values measured in the morning

LV = 250  $\mu\text{g} / \text{m}^3$  - the value of 98% of daily values series for  $t < 1$  h

Particles in suspension with  $\varphi < 10 \mu\text{m}$

LV = 50 p,g/m<sup>3</sup>  $t = 24$  h

LV = 40  $\mu\text{g}/\text{m}^3$

Material particles  $\varphi < 2,5 \mu\text{m}$

LV = 50 p,g/m<sup>3</sup> for  $t = 30$  minutes

LV = 20 p,g/m<sup>3</sup> for  $t = 24$  days

Values recommended by WHO

Cd potentially carcinogenic element tolerated by the human body under 0,005 p,g/m<sup>3</sup>

Cr carcinogenic risk is 4/10<sup>-2</sup> for the entire life for an exposure to an

average concentration of 1  $\mu\text{g}/\text{m}^3$

Pb 0,5 p,g/m<sup>3</sup>

Co 60.000 µg/m<sup>3</sup> per year at an exposure of 30 minutes and

10.0 p,g/m<sup>3</sup> for T = 8 h

NO<sub>2</sub> 400 µg/m<sup>3</sup> for t < 1 h, 150 µg/m<sup>3</sup> for t = 24 h

Values recommended by IUFRO for vegetation protection

NO<sub>2</sub> 95 µg/m<sup>3</sup> for 4 h of exposure,

SO<sub>2</sub> 150 p,g/m<sup>3</sup> for exposure of t < 1 h

#### Pollution with dust

During the execution of works, the theoretical maximum concentrations per 30 minutes (in prolonged dry periods) can reach the following values for short periods and on the restricted areas without affecting the biological environment:

300 µg / m<sup>3</sup> (the value allowed by CMA norm - 500 µg / m<sup>3</sup>, the value allowed by EU regulations – 250 µg/m<sup>3</sup>), in the work point.

200 µg / m<sup>3</sup> (the value allowed by CMA norm - 500 µg / m<sup>3</sup>, the value allowed by EU regulations. – 250 pg/m<sup>3</sup>), at a distance of 50 from the work point.

55 µg / m<sup>3</sup> (the value allowed by CMA norm - 500 µg / m<sup>3</sup>, the value allowed by EU regulations. – 250 pg/m<sup>3</sup>), at a distance of 250 m from the work point.

#### Preventive measures for air quality protection

Dispersion of activities in the operating perimeter does not allow adopting gas treatment and collection solutions into the atmosphere with fixed installations.

However, the objective will adopt technical and organizational measures to reduce to a minimum atmosphere pollution, by adequate maintenance of plant, their periodic checking and replacement of those with major defects.

All plant and transport tip lorries will be equipped with Euro 4 engines, which observe international standards regarding emission of pollutants into the atmosphere during operation.

Ensuring the functioning of the vehicle engines in normal parameters, their rational use (avoiding excessive speed and load) and compliance with the operating methodology will lead to maintaining the level of exhaust gas released below the admissible limits.

Regarding dust, emissions into the atmosphere by vehicles circulation after starting the operating activity, they can not reach high concentrations that can be harmful for the environment.

➤ Limits imposed by environmental legislation in force:

STAS 12574/87 provides the following limit values:

Polluting substance	CMA – short duration average (mg/mc)	Alert threshold (mg/mc)
Powders in suspension	0,5	0,35
Carbon oxyde	6,0	2,0
Nitrogen dioxyde	0,3	0,1
Sulphur dioxyde	0,75	0,25
COV	-	-

\* According to Order 756/97: - the alert threshold represents 70% of CMA;

- intervention threshold represents the excess of CMA.

➤ Measures to reduce impact during the execution period

Air pollution is due to handling and transport of construction materials, plus excavation works for the pillars foundation; because of this it is recommend wetting the the access roads in dry periods to limit dust emission.

It is recommended that machinery and transport means have their technical revisions updated, and the fuel supply be made by observing the conditions for environment protection (soil and air). It is recommended that transport equipment is supplied with fuel at fuel stations.

Sources of air pollution associated with activities that will take place in the studied site are free, open sources, with completely different features than sources for industrial activities or similar. Hence, we do not refer to collection - treatment evacuation installations of polluted air/waste gas into the atmosphere.

The problem of installations for the collection - treatment of waste gas and retention of dust arises for installations for the preparation of cement concrete, which must be done in off-site concrete plants.

Installation of collection - treatment systems (particle retention) is required at cement silos where bag filters are provided (with recovery by vibrating - shaking) - 99.9% efficiency.

In order to reduce particulate emissions from cement concrete preparation plants is recommended to use installations based on modern technology that are less polluting.

Regarding emissions from motor vehicles, they must meet the technical conditions specified in the technical inspections that are performed periodically throughout their use, for all vehicles registered in the country.

To limit air pollution to the maximum in the area adjacent to the perimeter of operation, due to operation of internal combustion engines (machinery and cars in the gravel plant) will be procured equipment with Euro 4 engines and measures will be taken to reduce the advanced wear the respective engines and their periodic repair.

Measurements of harmful gas emissions will be made during operation of equipment and machines, and the machines with major flaws will be replaced.

For the winter period, the parks of machinery and transport means will be equipped with electric starting robots, to avoid the evacuation of exhaust gases during long or difficult startups. Such equipment shall be provided also to the work sites.

Machinery and transport means will be checked regularly in terms of the level and concentrations of carbon monoxide emissions in exhaust gases and will be put into operation only after repairing any faults.

For performing the works it is recommended to use only transport equipment and vehicles equipped with diesel engines which do not produce Lead emissions and very little carbon monoxide.

Refuelling of transport vehicles shall only be made off-site.

Technological processes that generate dust such as the earthworks will be reduced during periods of strong winds, or the areas will be thoroughly sprinkled with water.

The temporary pits of excavated earth must be limited to max. 2 m height

Site roads will be permanently maintained by leveling and sprinkling with water to reduce dust. In the case of earth transport, routes will be provided whenever possible located on the very body of the fill so that on the one hand to obtain an additional compaction, and on the other hand to narrow the area of emissions of dust and exhaust fumes. Transporting the excavated earth must be made by transport means covered with canvas.

Operation period:

There will be two sources of air pollution, namely the technological oven and the flare.

The plant will be equipped with a flare for incineration and dispersion of accidental gas emissions, as defined in the IPPC, the reference documents for the most advanced technologies in the field of mineral oil refineries.

The main effluent is hydrogen sulfide (H<sub>2</sub>S) which will be produced in the hydrotreater. The quantity will be very small, below 24 Kg/h. This will be absorbed by the amine plant, and then will be sent to the burner of the furnace or flare. The use of MDEA amines is compatible with BAT.

The heat generated by the oven where hot oil is heated (medium heat) will be generated by 1,188 tonnes/year of gas produced in the hydrotreater, completed by 3,212 tonnes/year of natural gas.

The emissions will be as follows:

NO<sub>x</sub>: (0.4kg/h) low NO<sub>x</sub> burners (John Zink, ZEECO or equivalent).

CO: (0.3kg/h) low using modern burners.

- CO<sub>2</sub>: (1000kg/h)
- SO<sub>2</sub>: (35kg/h)

There is a programme of prevention and detection of gas leaks in the plant.

The pumps will be equipped with seals that prevent leakage

The valves will be equipped with seals that prevent losses

All safety valves will discharge to the flare system.

Compressors will be equipped with the most modern seals that prevent leaks.

The flanges within the hydrotreater will be RTJ, which are the safest in terms of leakage.

The tanks for light products will be equipped with breather valves (instead of atmospheric vents).

The valves of the tanks and the non-condensable gases will be sent to the flare.

Chemically impure water will be stripped for H<sub>2</sub>S elimination, and then sent to the flare.

All burners will be NO<sub>x</sub> reduced burners.

The reactors in the hydrotreater require the replacement of the catalyst every 6 months. These catalysts will not contaminate the environment, but will be sent to the original provider for regeneration and recycling.

The applicable regulations do not provide standards of emission for free and unguided sources. Regarding the mobile sources, standards are provided for emission for road vehicles, the compliance falls under the responsibility of the vehicle owners who will be involved in work road traffic.

The impact assessment for the sources related to the consolidation activity was conducted through mathematical modeling, the results being related to the maximum allowable concentration values (CMA) provided by:

- National standard for air quality (STAS 12574-87)
- EU air quality standards
- guide-values to Air Quality recommended by the World Health Organization (WHO)
- guide-valueslines recommended by the International Union of Forest Research Organizations (IUFRO) for vegetation protection

The following are to be presented: CMA, limit values (VL) and guide-values referred / recommended by the National standard and the mentioned International organizations for the pollutants specific for the studied sources.

#### **CMA provided by STAS 12574-87**

	<b>30 minutes</b>	<b>annually</b>
• SO <sub>2</sub> :	750 µg/m <sup>3</sup>	60 µg/m <sup>3</sup>
• NO <sub>2</sub> :	300 µg/m <sup>3</sup>	40 µg/m <sup>3</sup>
• CO:	6000 µg/m <sup>3</sup>	-
• particles:	500 µg/m <sup>3</sup>	75 µg/m <sup>3</sup>
• NH <sub>3</sub> :	300 µg/m <sup>3</sup>	-
• Cd:	0,06 µg/m <sup>3</sup> (calculated from CMA <sub>24 h</sub> )	-

- Cr<sup>6+</sup>: 4,5 µg/m<sup>3</sup> (calculated from CMA<sub>24</sub> h) -
  - Pb: 2,1 µg/m<sup>3</sup> (calculated from CMA<sub>24</sub> h) -
  - substances
- synergistic:  $C_1/CMA_1 + \dots + C_i/CMA_1 < 1$  -
- formaldehyde 35. -

STAS does not provide CMA for the other heavy metals emitted, nor for HAP.

### Limit values established by the EU Directives

NO<sub>x</sub> VL = 200 µg/m<sup>3</sup> for t ≤ 1 Hour

VG = 135 µg/m<sup>3</sup> for t ≤ 1 Hour

The above values represent concentrations associated with percentile 98.

VL = 40 µg/m<sup>3</sup> for t = 1 year – proposed

VG = 30 µg / m<sup>3</sup> for t = 1 year - for the protection of sensitive ecosystems in undeveloped areas

CO VL = 10.000 µg/m<sup>3</sup> for t = 8 hours

SO<sub>2</sub> VL = 80-120µg / m<sup>3</sup> median of the daily mean values measured for 1 year, associated with the median daily values measured for 1 year for particles: > µ40 g / m<sup>3</sup>, respectively ≤ 40 µg / m<sup>3</sup>

VR = 100 – 150 µg/m<sup>3</sup> for t = 24 hours

VR = 40-60 µg/m<sup>3</sup> for t = 1 year

VL = 350 µg / m<sup>3</sup> - value of the 98 percentile for strings of values for t ≤ 1 hour associated with ≤ 150 µg / m<sup>3</sup> for particles

VL = 250 µg/m<sup>3</sup> - value of the 98 percentile for strings of values for t ≤ 1 hour associated with ≤ 150 µg / m<sup>3</sup> for particles

VL= 125  $\mu\text{g}/\text{m}^3$  for t = 24 hours

VL= 20  $\mu\text{g}/\text{m}^3$  for t = 1 year, ecosystem protection

VL= 10-15  $\mu\text{g}/\text{m}^3$  for t = 1 year in areas with instruments (appliances, etc.) sensible to the SO<sub>2</sub> damages

Pb 0,5  $\mu\text{g}/\text{m}^3$  for t = 1 an

#### Particles in suspension

VL = 80  $\mu\text{g}/\text{m}^3$  median of the daily mean values measured for 1 year (gravimetry) totals

VL = 250  $\mu\text{g}/\text{m}^3$  - value of the 98 percentile for daily strings of values for t  $\leq$  1 hour

VG = 40-60  $\mu\text{g}/\text{m}^3$  for t = 1 year

VL= 100-150  $\mu\text{g}/\text{m}^3$  for t = 24 hours

#### Particles in suspension with $\Phi \leq 10 \mu\text{m}$

VL = 50  $\mu\text{g}/\text{m}^3$  for t = 24 ore

VL = 40  $\mu\text{g}/\text{m}^3$  for t = 1 year and 20  $\mu\text{g}/\text{m}^3$  from the year 2010

#### Particles in suspension with $\Phi \leq 2,5 \mu\text{m}$

VL = 50  $\mu\text{g}/\text{m}^3$  for t = 30 minutes - proposed

VL = 20  $\mu\text{g}/\text{m}^3$  for t = 24 hours from the year 2010 - proposed

VL – Current limit value

VG – value – guide

#### Guide-value recommended by OMS

Cd - potentially carcinogenic tolerable, to the average annual concentration of 0.005  $\mu\text{g} / \text{m}^3$ ;

Cr - for our lifetime exposure to an average concentration of  $1 \text{ g} / \mu\text{m}^3$  the cancer risk is  $4 \cdot 10^{-2}$ ;

HAP (ca benz(a)piren) - for our lifetime exposure to an average concentration of  $0.001 \text{ g} / \text{m}^3$  the cancer risk is  $8.7 \cdot 10^{-5}$ ;

Ni - for our lifetime exposure to an average concentration of  $1 \mu\text{g}/\text{m}^3$  the risk of cancer is  $3,8 \cdot 10^{-4}$ ;

Pb -  $0,5 \mu\text{g}/\text{m}^3$  as annual average;

CO -  $60.000 \mu\text{g}/\text{m}^3$  for  $t = 30$  minutes and  $10.000 \mu\text{g}/\text{m}^3$  for  $t = 8$  hours;

NO<sub>2</sub> -  $400 \mu\text{g}/\text{m}^3$  for  $t \leq 1$  hour,  $150 \mu\text{g}/\text{m}^3$  for  $t = 24$  ore

formaldehyde  $100. \mu\text{g}/\text{m}^3$  for  $t = 30$  minutes

### **guide-values recommended by IUFRO for vegetation protection**

NO<sub>2</sub> -  $95 \mu\text{g}/\text{m}^3$  for 4 hours of exposure,  $30 \mu\text{g}/\text{m}^3$  as annual average in the presence of  $\leq 30 \mu\text{g}/\text{m}^3$  SO<sub>2</sub> and of  $\leq 60 \mu\text{g}/\text{m}^3$  O<sub>3</sub> - ecosystem protection;

SO<sub>2</sub> -  $150 \mu\text{g}/\text{m}^3$  for exposure  $< 1$  hour,  $30 \mu\text{g}/\text{m}^3$  as annual average in the presence of  $\leq 30 \mu\text{g}/\text{m}^3$  SO<sub>2</sub> and of  $\leq 60 \mu\text{g}/\text{m}^3$  O<sub>3</sub> - ecosystem protection;

### **Compliance of the activity with the provisions of the Law 278/2013 on industrial emissions**

The project complies with the provisions of the Law 278/2013 on industrial emissions. In accordance with Annex 1 to the Law 278/2013, the activity of refining waste oils fits within art. "5. Waste management; point 5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day, letter j – re-refining or other reuses of the oils."

### **Possible environmental impact in a transboundary context**

In accordance with the provisions of Annex No. 1 of Law 22/2001 ratifying the Convention on Environmental Impact Assessment in a Transboundary Context, adopted at ESPOO on 25 February 1991 in conjunction with the fact that the proposed investment is the proximity of the Romanian-Bulgarian border, the developed investment falls under the scope of Article 6 "Integrated chemical installations." The distance to the Bulgarian border is of 1,000 m.

## **The dispersion of pollutants in the air**

Determining the concentrations fields of the pollutants in the atmosphere was performed with the climatology model based on the Gaussian solution of equation diffusion.

**Model entry data:**

- pollutant emission characteristics:

- the amount of pollutants discharged into the atmosphere per unit of time
- exhaust gas temperature
- exhaust speed

- physical parameters of the sources:

- height
- the diameter or surface of emission
- The weather parameters - in the form of  $\Phi$  function of frequency (k, l, m) of the triplet wind direction, wind speed class and stability class, established on long strings of data (multi-annual), ambient temperature

- calculation scale:

- sources coordinates relative to the origin of the established scale
- calculation step
- scale size (the maximum distance to which the calculations are made)

The model allows the calculation of the average concentration of the pollutant in any point at a distance from the source / sources, taking into account the contribution of all sources. As a result, it is possible to calculate the concentrations in an area around the source. To this end, shall be delimited the area of interest, and on its surface a grid is fixed, usually square, whose knots represent the receptors.

The number of knots and the grid step are chosen depending on the source characteristics, for the area of interest and the issues that need to be answered. The grid will have an origin and a coordinate system with the Ox axis to the east and Oy-axis to the north, according to which the sources and knots coordinates are established.

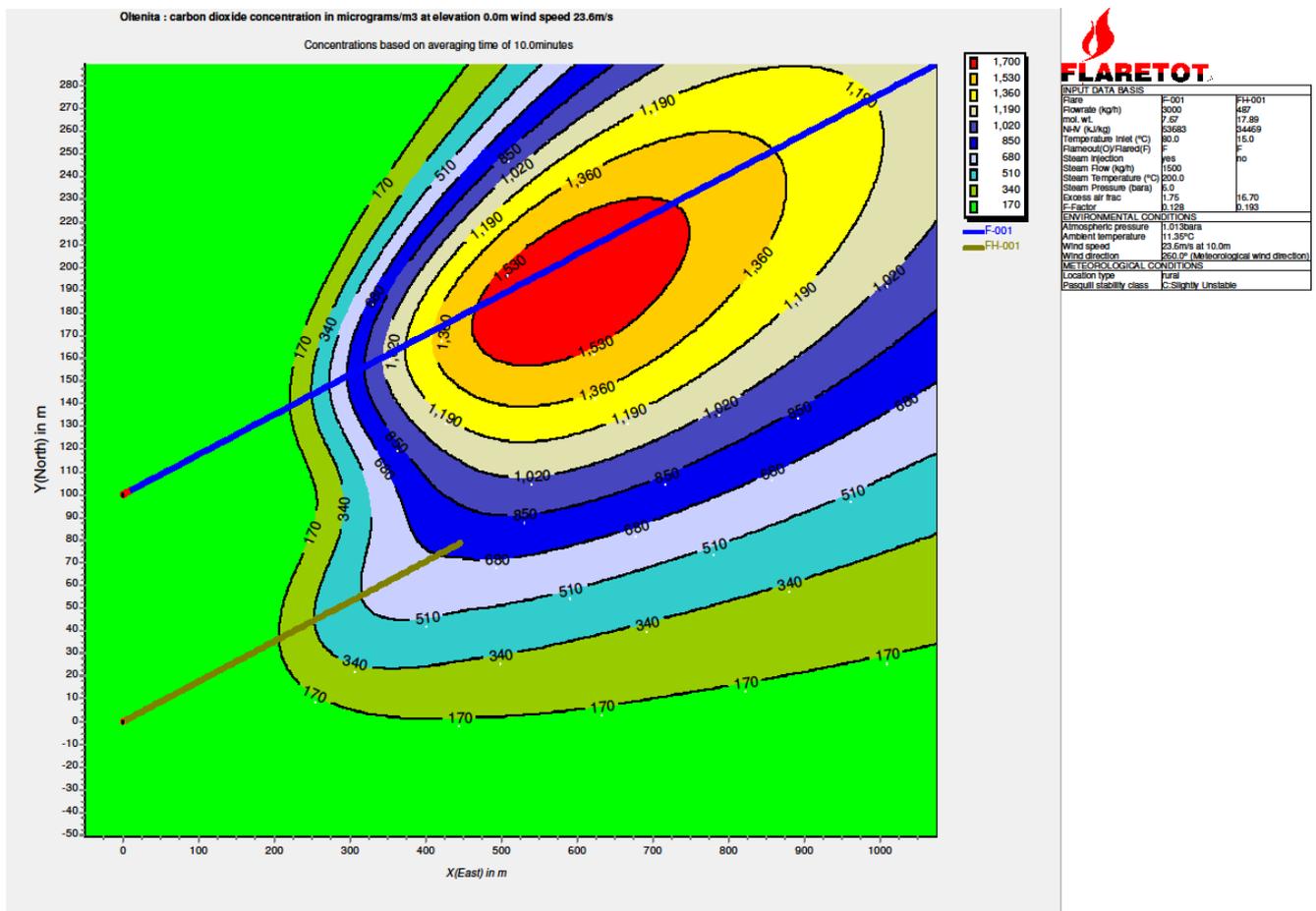
**Output data** (results) of the model:

- the maximum values of the concentrations averaged over short term (30 minutes)
- annual frequencies of exceeding the CMA for 30 minutes (%)
- annual average concentrations.

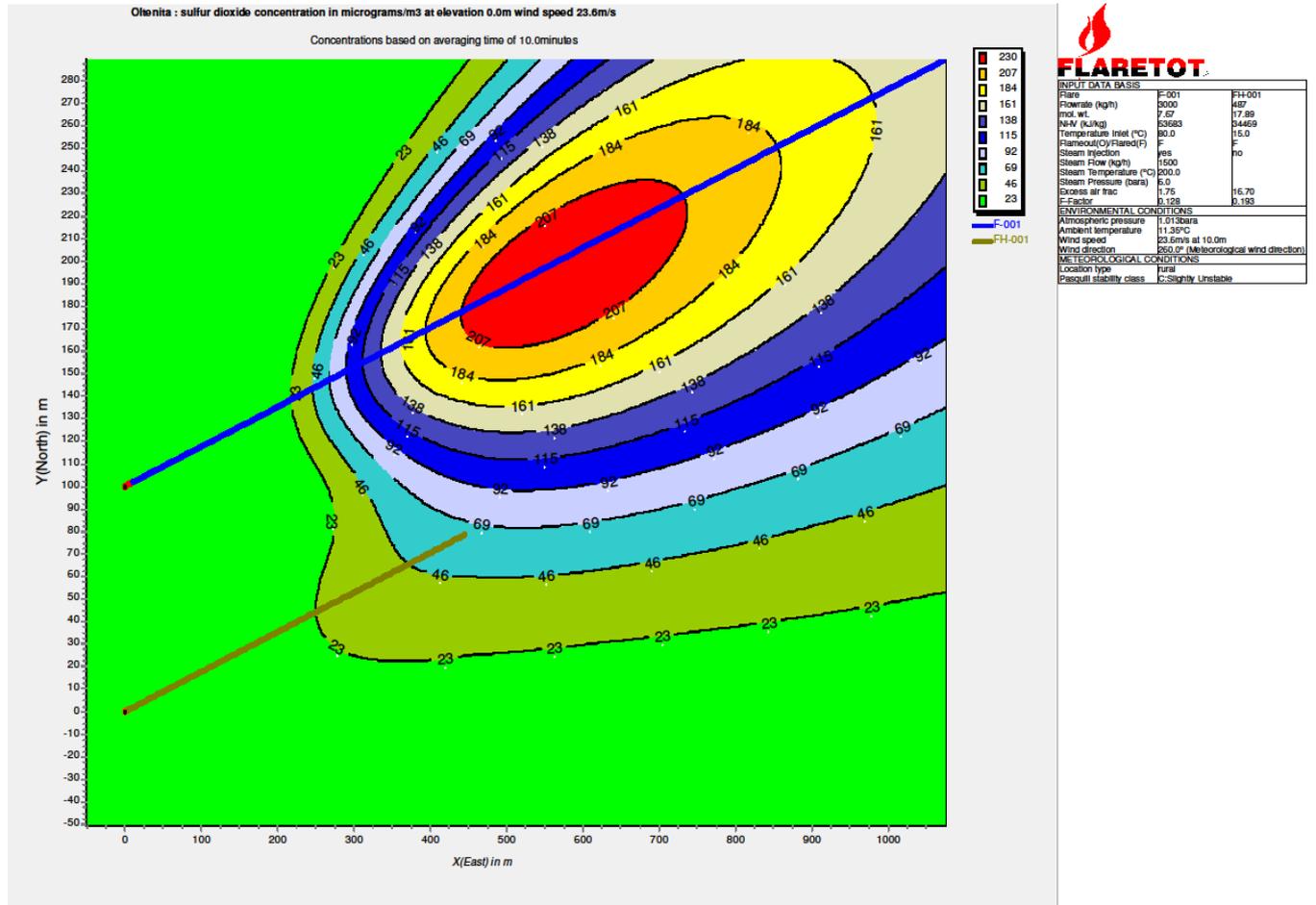
Depending on the mode of operation of the sources, changes in their functional parameters, the model can be adapted in the sense of obtaining mediation of the concentrations for other periods of time (month, season).

The results of pollutant concentrations may be obtained in the form of curves of ISO-concentrations (equal concentration) of pollutants and equal frequency curves to overcome the CMA on 30 minutes, overlapped on the map of the studied area.

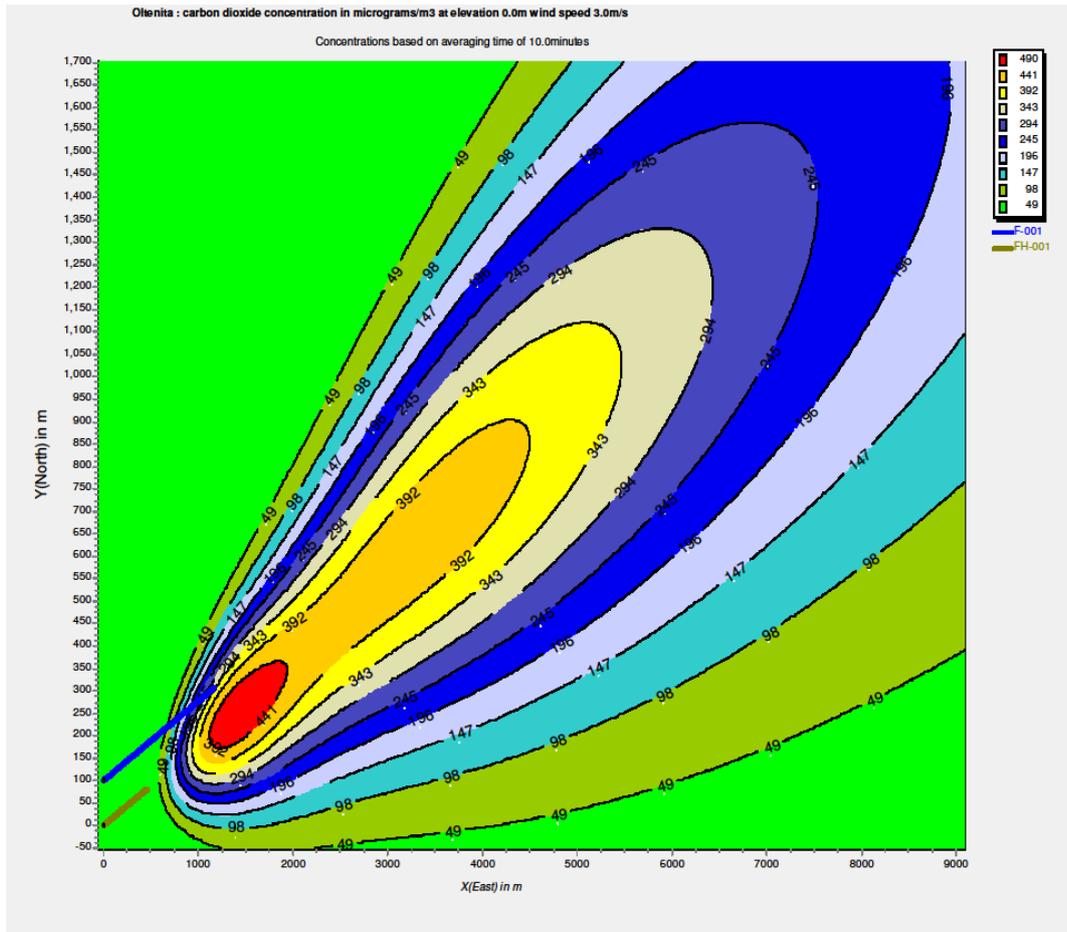
Choosing values of the ISO-concentrations curves represented on the map are made so that the impact on air pollution is very well highlighted: it traces the iso-line of equal value with the CMA (if this is achieved) or other values-guide, it draws iso-lines passing through the protected areas (homes, schools, hospitals, natural or architectural monuments, etc.)



**CO dispersion of the wind speed of 23.6 m / s**



SO2 dispersion of the wind speed of 23.6 m / s



**FLARETOT**

INPUT DATA BASIS

Flare	F-001	FH-001
Flowrate (kg/h)	3000	487
mol. wt.	7.67	17.89
New (kg/kg)	63653	34629
Temperature inlet (°C)	80.0	15.0
Flareout(C)/Flareout(F)	F	F
Steam Injection	yes	no
Steam Flow (kg/h)	1500	
Steam Temperature (°C)	200.0	
Steam Pressure (bara)	5.0	
Excess air frac	1.75	16.70
F-Factor	0.129	0.193

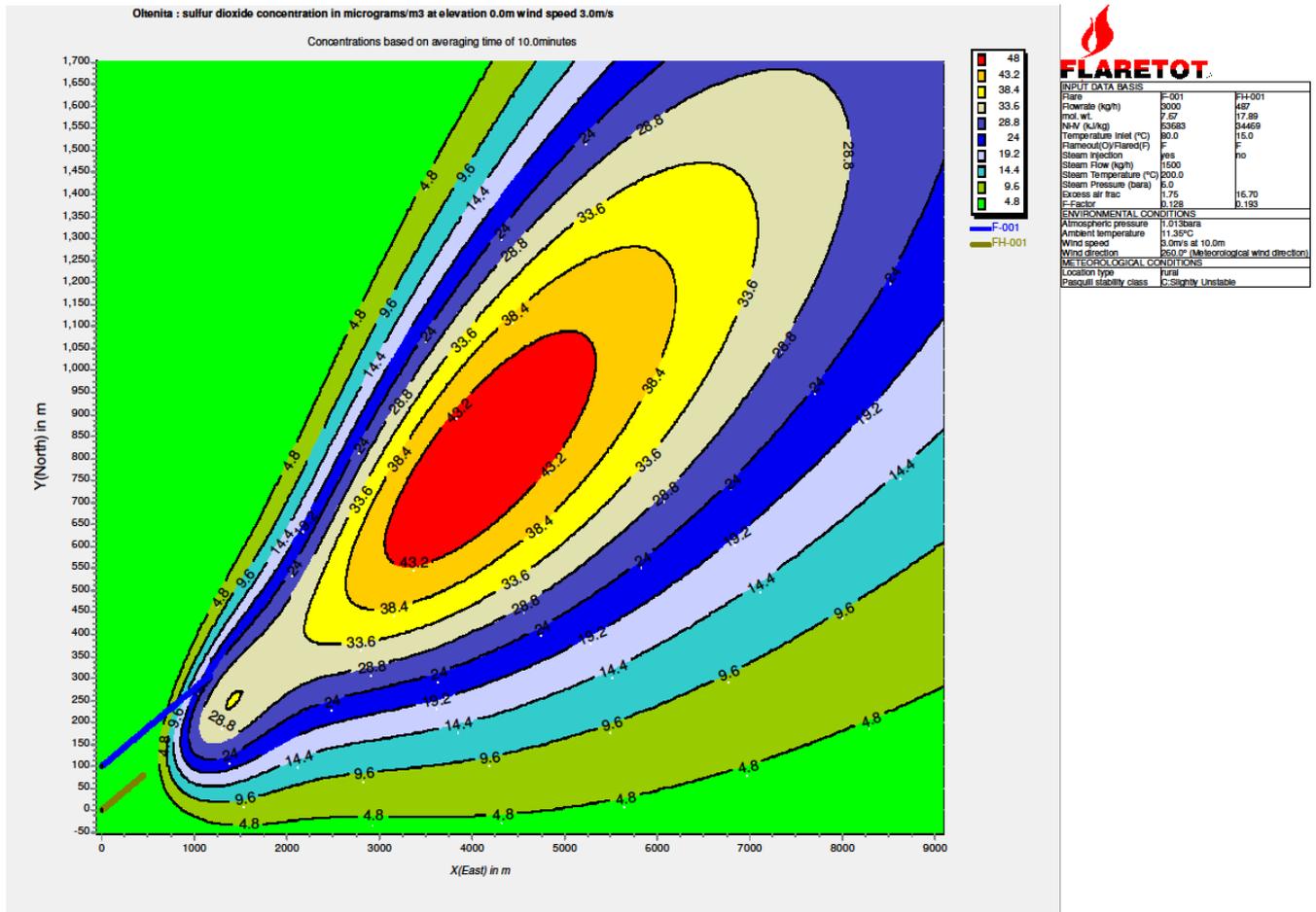
ENVIRONMENTAL CONDITIONS

Atmospheric pressure	1.013bars
Ambient temperature	11.35°C
Wind speed	3.0m/s at 10.0m
Wind direction	250.0° (Meteorological wind direction)

METEOROLOGICAL CONDITIONS

Location type	rural
Passout stability class	C-slightly Unstable

### CO dispersion of the wind speed of 3 m / s



### SO2 dispersion of the wind speed of 3 m / s

The above results represent the maximum impact on the air quality situation.

⇒ Measures to reduce impact during the operation period

The reduction of the amounts of dust in suspension can be made by using protection screens (covers) to reduce the wind speed in the area of the objective. Also, the reduction of the amount of toxic fumes will be made by installing high performance exhaust systems.

The temperature at which work is done and the tightness of equipment using oil does not lead to the formation of volatile organic compounds.

### Noise and vibrations

The noise is a ubiquitous environmental factor for the boundary between the necessary and the harmful, depending on many factors (physical of noise, personal of the receptor or other external variables) is difficult to establish.

Occupational exposure at high enough levels of noise over a relatively short period of time is responsible for the hearing effects of limiting the auditory acuity, and the action as an associated risk factor with the occurrence and severity of hypertension, in increasing the risk of myocardial infarction, and so on.

Prolonged exposure to increased noise levels produces acute and chronic disorders that lead to changes in the entire human body.

The impact on the body is manifested by:

- rapid heart rate, high blood pressure, increasing the frequency and respiratory amplitude etc
- impact on the cerebral cortex that reacts simultaneously or independently by decreasing attention, the occurrence of insomnia, fast fatigue, resulting in reduced intellectual work, the occurrence of headache, neurasthenia, etc.;
- among the diseases caused by noise are also quoted: neuroses, psihasthenia, gastritis, gastric and duodenal ulcers, colitis, diabetes, hyperthyroidism, etc.

Exposure of the population characterized by lower but persistent levels, the main effects are the non-specific ones, due to the action of neurotropic stressor of the noise. This is manifested in the psychic area, from the simple reduction of attention and retrieval of the mnezical and intellectual capacities, to psychiatric and behavioral conditions, clinically translated by fatigue, irritability, and feeling of discomfort. Exposure to noise can cause various types of reflex response, especially if the noise is unexpected or of unknown nature. These reflexes are mediated by the autonomic nervous system and are known as stress reactions. They express a defense reaction of the body and have a reversible character for short-term noise. Systematic or persistent repeating of the noise definitive causes alterations of the neuro-vegetative system, circulatory, endocrine, sensory, digestive, disorders, etc.)

Effects on the body due to chronic exposure to noise, listed in the literature, are presented in the following table:

#### Critical exposure level and effects

- noise level equivalent db (A)	Effects
20 ÷ 45	Reducing the speech intelligibility
35/interior	Impairment of sleep quality
42/exterior	Discomfort
55/interior	Revivals
70/exterior	Cardiac disease
75/interior	hearing impairment
70/exterior	high blood pressure

#### Factor of environment - Soil

In the studied area construction never existed before.

Pollution of soil and subsoil occurs because of the removal of the soil layer for the constructions.

There are various materials located on the soil which affect its quality due to the debris and dust remaining after use.

Another source of soil pollution is the spills of petroleum products, solvents, primers and paints and other technological waste to which can be added household waste deposited uncontrollably.

Soil protection is achieved by recovering the soil and temporary storage in order to be used in the ecological rehabilitation process of the operating area.

Proper storage of materials on specially designed surfaces and recovery of unusable scrap are also ways to protect the quality of soil.

Spills of petroleum products can be avoided by the permanent control and operative repair of the occurring defects.

Construction period

During the construction period, the actions on the soil are temporary, mainly visible by occupying for a limited period the plots of land for the site organization, access roads and technological platforms. Also, there will be areas of land occupied permanently by making concrete platforms, access roads and technological platforms for machines, that continue to remain active for maintenance.

The impact on soil during the construction period occurs either directly or through the dispersion media.

The impact forms on soil that may be identified during the construction period of works are:

chemical pollution through toxic substances in the deposit of dust on the ground;

Soil quality changes under the influence of pollutants present in air; qualitative and quantitative alterations of local geochemical circuits.

physical degradation of the soil and subsoil on areas adjacent to the analyzed objectives; a short period of reversibility is estimated after completion of works and restoration of these areas;

- accidental spills of petroleum products in the areas of work - relatively low likelihood if the measures for environmental protection are complied with;

- bank landslides, erosion due to improper protection of excavation works carried out;

- activation of underground sources of pollution by inducing changes on groundwater regime in excavated areas;

- soil compaction under the effect of heavy machinery traffic used to make the foundations

Types of pollution mentioned above can cause the change of the following characteristics of soil:

- changes in the soil pH;

- soil contamination with heavy metals and hydrocarbons, locally, in the area of the site where works are performed or adjacent to those;

- physical changes that affect natural soil characteristics and properties.

Dusts resulted from the processes of excavation, loading, transportation and unloading of the earth for earthworks, settled by gravity on the ground, should not be considered pollutants. Problems can be raised by their association with other pollutants present in the atmosphere at that time, in large quantities.

Dust particles

This category could include fine dusts resulted from handling construction plant. Surfaces of soil on which a deposit of  $100 \div 200$  g / sqm / year are made may be affected by changes in pH and susceptible to structural changes.

In terms of soil pollution, the excess of C.M.A. in air of particle matter in suspension is not problematic as long as they are generated from ground handling.

Other particles, besides earth particles, generated during construction are derived from construction materials, among which the largest share is that of cement particles.

### Nitrogen and sulfur oxides

These acids are thought to be the main substances responsible for the formation of deposits and acid rain. Acid deposits can occur however at varying distances but generally it is difficult to identify the exact source and to quantify the concentrations at ground level.

The effect of these deposits, especially of acid rain is soil acidification, which entails the depletion of the ground fauna, creating conditions for anabiosis of some plant species, in a word decreases the productive capacity of the soil.

The temporary occupation of land will be determined by the requirement of developing site organization or production bases (respectively offices adjacent to analyzed objectives; it is estimated a short period of reversibility after finishing the works and restoration of these areas, the deposits of materials), access roads for transport of raw materials.

The contractor shall not be allowed to work outside the limits given, except in exceptional circumstances and with written approval of the environmental authority.

In this moment we can not predict this requirement.

In conclusion, the activities performed during the execution of the works designed directly impacts soil which can be reduced by adequate protection and organizational measures.

Construction works can be a source of pollution of soil and subsoil pollution by the inert waste that may result. They consist of debris from construction materials.

Adjacent to them, household waste from the staff who works on the objective may become a pollution source.

Rhythmic evaluation of all types of waste constitute a measure which is absolutely necessary.

The Company will enter into a service contract for the disposal of household waste and inert waste on the site.

Through the project development, waste disposal installations are necessary, because the waste resulted from the investment will be taken over and carried by authorized specialized companies.

Regarding excavated soil and stones that will result due to the need for the investment performance, it will be partially reused to restore the landscape, respectively for filling, and the rest will be transported and stored at a landfill for inert wastes.

All equipment in the objective must operate in the designed parameters.

### Measures to reduce the impact on the ground

For soil protection, mitigation measures are taken since the design stage, taking also into consideration environmental factors, as well as by optimizing the route of the access roads.

### Soil protection measures during execution

In the construction phase, the impact on the soil environmental factor can be reduced by:

- the works rigorously made as designed, with the observance of the succession of construction stages, elevations and all elements provided by the designer;
- careful handling, according to the regulations, of the chemicals, materials and fuels used for the works;
- seal any fuel storage tank and fuels (the fuel supply is recommended to be made off-site);
- interdiction of carrying out repairs to machinery and vehicles that are used in uncovered areas or other areas where various products that can be pollutants reach the underground;
- washing the machines and vehicles outside areas designated for this type of activity;

- immediate removal of topsoil if it is found it is affected by local pollution, thus eliminating the possibility of substances infiltrating underground and its storage in containers until treatment;
- achieving a proper site organization in terms of facilities and environmental protection;
- provision of ecologic toilets for the staff on site and in workstations;
- inside the site organization you must ensure draining the rainwater that washes a large area, on which there may be various substances from any spills, in order not to form puddles, which in time can infiltrate underground, polluting the soil and phreatic water;
- avoiding degradation of the surrounding areas and of existing vegetation in the adjacent perimeters by stationing of the equipment, performing repairs, storage of materials, etc.;
- collecting all waste resulting from construction activity and, where appropriate, their recovery;
- avoiding fuel spills at the stationing of construction equipment from the tanks or pipes connecting them; in this respect all construction and transport machinery used will first be carefully checked.

It also requires that the working platforms, for preparation of concrete and other necessary facilities for the construction period, to be carefully designed not to affect the soil and subsoil.

For the period of construction funds are provided and the manufacturer obligation to carry out all necessary environmental protection measures for polluting or potentially polluting activities (production units, storage units of materials, site organization).

Contracting terms will have to include specific measures for waste management produced in locations to prevent soil pollution.

Among these are the following:

- The use of any toxic substances in the building process will be done only after obtaining the necessary approvals, depending on their characteristics, including storage measures.
- Storage of flammable or explosive substances shall be done in strict compliance with specific legal rules.
- Handling paints and fuels or other substances of chemical nature so as to prevent spilling and spreading on the ground.
- Transportation and proper storage of waste resulting from construction, avoiding losses in transport and choosing the appropriate deposit.

The manufacturer is also required to ecologically reinstate land occupied or temporarily affected.

In case of accidental spills of pollutants, measures will be taken for the rapid intervention by spreading sand, removing topsoil affected and its evacuation in hazardous waste landfills.

Monitoring of construction works will ensure the adoption of necessary measures for environmental protection.

#### Soil protection measures during operation

We recommend the adoption of organizational measures for corresponding maintenance of the soil and subsoil, respectively:

- Eliminating through recovery of parts resulting from activity
- Elimination of any type of waste that could affect soil quality;
- Adequate maintenance of access ways

By observance of the waste regime, including both regular elimination and proper storage, is considered that will not exert a significant negative impact on the environment above and below ground.

Both during execution and operation, the unit will be equipped with platform designed for placing specialized containers for temporary and selective storage of wastes - wastes that would be retrieved later for download to the deposits authorized by service contract or recycled, as appropriate.

#### Waste management

By GD 856/2002 for the Avoidance of waste management and for the approval of the list containing the wastes, including hazardous waste establishes the requirement for the economic agents and of all other generators of waste, natural and legal persons, to keep record of the waste.

According to the list mentioned, waste resulting from construction activity is classified as follows:

- 17.01.07 concrete, bricks, ceramic materials;
- 17.02.01 wood;
- 17.02.03 plastic;
- 17.04 metals and their alloys;
- 17.05 earth and excavated materials;
- 17.09.00 waste mixed with construction materials;

Inert waste will result from the construction stage. They will be eliminated based on the service contract concluded.

Of the excavation activities necessary for the development of foundations result waste earth and excavated materials, plant residuals, stone and crushed stone.

The works will be made according to quality standards in construction so the amount of waste resulted to be limited to a minimum.

The working staff employed for the construction works will generate domestic waste, to be collected through the garbage collection company that takes the rest of domestic wastes from the site.

The total amount of waste produced is determined by the total number of people employed on site and the duration of works execution.

Waste generated during the production unit existence are of two types:

- domestic waste
- process waste

Domestic wastes will be collected in plastic bins which will be stored on a platform inside the premises.

Process waste is of two types:

- recoverable
- nonrecoverable

Technological residues come from different operations performed within the unit. They can be classified into several categories:

- Other fuels, including mixtures
- Unspecified oil waste
- Hydraulic oils containing PCB
- other hydraulic oils
- other transmission oils, for engine and lubrication
- other insulating oils and heat transmission oils
- wastes from the separation of oil from water

- slurry from oil water separators
- oil waters from oil water separators
- packages contaminated with hazardous substances
- contaminated filters

Machinery and transport means will be brought on site in normal operation condition having performed the maintenance operations and oil changes in specialized workshops.

The same procedure will apply for maintenance and battery recharging operations, etc., that will be done only in specialized workshops.

It is difficult to make a quantitative assessment of this waste, the technologies adopted by the entrepreneur having priority in assessing the nature and quantity of waste.

The activities of the site will be monitored in terms of environmental protection, which will include mandatory monitoring of waste management.

#### Waste management

Waste management during the execution of the works designed summarizes as follows:

**Table no. 7. Waste management**

Site	Type of	Collection/evacuation manner	Remarks
Site	Domestic or similar	Inside the premises will be organized collection points provided with bin type containers. They will be emptied periodically (at least once a week)	They will be eliminated at waste deposits based on contract with specialized companies.
	Metallic waste	They will be collected on the site premises, on platforms and/or in specialized containers.	They will be recovered compulsorily by specialized companies.
	Waste of construction materials	In terms of the potential contaminant, these wastes are inert, consisting of sterile and concrete debris. In terms of capitalization and their elimination, depending on the context of the situation it is suggested the use of the material for filling, leveling.	They will be eliminated at waste deposits based on contract with specialized companies.
	Used oils	Potentially polluting materials on the environment. Operations will be made only in specialized workshops	They will be managed in specialized recovery companies.

Site	Type of	Collection/evacuation manner	Remarks
	Used tires	In the category of storage spaces will be reserved for a tire waste area. It is recommended that in the specifications, the contractor shall be requested at least a presentation of one solution for the disposal of this waste to a recovery company.	Typical waste for site organizations.

Waste resulting from the investment, both in the construction phase and in the operational phase, will be stored according to the environmental legislation and evacuated in a controlled manner not to affect the quality of the environment.

The Company will conclude a contract for the elimination of waste resulting from the activity, respectively construction.

#### 4. Special Protection Areas (SPECIAL AREAS OF PROTECTION / SPECIAL AREAS OF CONSERVATION)

The site under review is located in the proximity of the site of Community importance RO SPA 0038 - Danube - Oltenita.

The ROSPA0038 Danube-Oltenita site is located on the Danube between km 451 and km 430, in the southern part of Romania, in the floodplain of the Danube.

It includes both the portion of the Danube between Greaca, Căscioarele, Oltenița and agricultural land that is part of the area within the dam Greek-Arges-Chirnovi. The geographic coordinates are 26° 29' 4" East longitude 44° 3' 48" North latitude. It stretches on a surface of 6022 hectares. The average altitude of the territory is 15 m. Most of it is located in Calarasi County, only 5% belongs to the Giurgiu County.

The ROSPA 0038 site is owned through custody since May 2016 by Bio Romania Association. A Management Plan for this site has also been developed.

##### ► Flora from the site; species composition

The area proposed for building the waste oil refining plant is located in a floodplain area.

The characteristic habitat is of arable farmland and shrub vegetation.

**► Local Fauna**

In the period from 09.08.2012 to 31.11.2013, Otus Association in Odorheiu Secuiesc carried out a „Survey of inventory, mapping and evaluation of the conservation status of the bird species, as well as the identification and mapping of the limits of the area of special aquatic fauna protection ROSPA0006, ROSPA0038, ROSPA0048, ROSPA0077, ROSPA0058 and ROSPA0064” (code CPV 79311100-8 and CPV 71354100-5).

Based on monitoring conducted by the beneficiary in the period October 2015 - May 2016 and based on the land forms with the bird species inventory made available by the Otus Association which covers the monitoring in all periods of the year, the following species have identified:

Period	April 2012	Aug- Sept 2012	Oct - Nov 2012	Dec 2012 - Jan 2013	Feb 2013	Mar 2013	Apr 2013	May 2013	Oct - Nov 2015	Feb – Mar 2016	April - May 2016
<i>Tachybaptus ruficollis</i>					6						
<i>Podiceps cristatus</i>							1				
<i>Pelacanus crispus</i>			22	3							
<i>Phalacrocorax carbo</i>		3	34	25	5	20	9	3	25	12	7
<i>Phalacrocorax pygmaeus</i>				1	6	1	49				3
<i>Ardeola ralloides</i>							10				
<i>Nycticorax nycticorax</i>	1					3	7				
<i>Egretta garzetta</i>	13	3				8			2	3	5
<i>Ardea cinerea</i>	1										
<i>Ciconia ciconia</i>						41		1		5	15
<i>Ciconia nigra</i>						1					
<i>Anas platyrhynch</i>				133	284	6		1		25	54

<i>os</i>																			
<i>Anas crecca</i>				1	1														
<i>Anas querquedula</i>	4							2											
<i>Buteo buteo</i>			1		1			2									2		
<i>Falco tinnunculus</i>										1									
<i>Phasianus colchicus</i>			1																
<i>Fulica atra</i>					6														
<i>Actitis hypoleucos</i>								2											
<i>Chroicocephalus ridibundus</i>	8	257	94					7	5	154									15
<i>Larus canus</i>								1											
<i>Larus michahellis</i>			5	3				5	2										
<i>Larus cachinnans</i>			3	1				6											
<i>Larus cachinnans/michahellis</i>	50			70					6	6									
<i>Sterna hirundo</i>									3										
<i>Chlidonias hybridus</i>										2									
<i>Cuculus canorus</i>									3	1									1
<i>Upupa epops</i>	2							6	1										
<i>Alcedo atthis*</i>		1							1										
<i>Merops apiaster</i>										3									

<i>Riparia riparia</i>							100	250			78
<i>Hirundo rustica</i>						80	40	5			34
<i>Delichon urbicum</i>						1					
<i>Motacilla alba</i>	x					2	5				
<i>Motacilla flava</i>						6					
<i>Luscinia luscinia</i>							1				
<i>Turdus philomelos</i>						10				5	
<i>Turdus merula</i>								1			1
<i>Phylloscopus collybita</i>						1					
<i>Phylloscopus trochilus</i>		2									
<i>Muscicapa striata</i>		1									
<i>Parus major</i>		2	2					3			
<i>Lanius collurio*</i>								1			1
<i>Lanius excubitor</i>					1						
<i>Garrulus glandarius</i>		1			1						
<i>Corvus monedula</i>						10	5		7		3
<i>Corvus frugilegus</i>				50		40	15		15		12
<i>Corvus corone cornix</i>			4			4	3				
<i>Sturnus</i>						80			53		

<i>vulgaris</i>									
<i>Oriolus oriolus</i>								1	
<i>Passer domesticus</i>		5				15			10
<i>Passer montanus</i>								4	
<i>Fringilla coelebs</i>		7				50			15
<i>Carduelis spinus</i>			5					3	
<i>Carduelis carduelis</i>		3				73	3		
<i>Carduelis chloris</i>								1	3
<i>Miliaria calandra</i>						2	1	1	1

Otus Association observations were made on the Danube, namely the Arges River confluence with the Danube, thus the aquatic bird species were observed on the Danube and the Arges. The bird species from May can be considered, nesting birds, aside from the species of swallows and house martins.

The observations made by the beneficiary were made both on the Danube and Arges and in the strict perimeter of the future project.

No protected species and no nests have been observed in the development of future project. The species seen in perimeter were observed during the feeding period or passage.

For the project's impact on the protected area ROSPA0038 an appropriate Evaluation Study has been developed and approved by the EPA Calarasi, the conclusion being that "the area is not of interest for bird species for which the site was designated, they do not use any in during nesting seasons and no other seasons, the being mostly degraded ". *The project also holds a favorable opinion of the Custodian of the site.*

## 5. Environmental objectives and the way these objectives were taken into account and any other environmental considerations during the preparation of the plan

The environmental protection objectives established are considering the framework recommendations for the following areas:

- Improving air quality (reduction of pollutants in the air, equipping large combustion plants with filter systems, purchase of monitoring equipment);
- Sustainable management of water resources (development of infrastructure - network sewerage and water supply stations, water treatment plants - to meet the requirements of water at source, improving the quality of water resources, sustainable use of water resources, prevention and protection from flooding);
- nature, biodiversity, forests, and soils protection and conservation (sustainable use of natural habitats, ecological reconstruction of damaged systems);
- Proper management of household waste, industrial, toxic and dangerous waste (the development of an integrated waste management system, a system of selective collection and waste recycling promotion, development of compliant waste treatment facilities);
- Defense against natural disasters and environmental accidents;
- Improving population health directly related to improving the quality of the environment.

The targets are presented as summaries of detailed measures to reduce / eliminate the social impact and the impact on the environment provided in the management plans. The summaries were made so as to present a more complete picture of the mentioned measures.

The indicators have been identified so as to allow preparation of proposals for monitoring the effects the implementation of the plan has on the environment. The targets and indicators were identified for each environmental objective, i.e., for each factor / environmental aspect to consider.

The table below shows the strategic objectives, specific objectives, targets and indicators for the thirteen factors / environmental issues relevant to environmental assessment.

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
Population	Improving the social conditions and life of the population	Increasing the number of jobs for the local population Creating conditions for the economic development of the area	Construction, together with local authorities, on the site, of all the necessary modern infrastructure and endowments Employment policy priority for the local population Measures and initiatives for economic growth of the area: stimulating business, co-financing projects	Number of jobs created / jobs in the project and creating the infrastructure The social responsibility of the investor Training programs organized by the investors Amounts earned and spent in community Price and cost of living in the community Post-secondary educational facilities, applicants, training courses, discipline training
Waste management	Compliance with legislation on the collection, treatment and disposal of waste	Diminishing soil and groundwater pollution through proper storage of household waste and technological waste Collection, treatment and disposal of industrial waste and assimilated waste in accordance with the legal provisions	Implementing the provisions of the Waste Management Plan, both for industrial waste and household waste, which takes into account the reduction / elimination of the environmental impact in terms of compliance with the existing legislation	Amount of waste by types Composition waste by type Reporting Documents Shipping documents and invoices issued by the operators of waste for the waste shipped outside the industrial area Amount of waste by type Composition of waste by type Reporting Documents Shipping documents and invoices issued by the operators of waste for the waste shipped outside the industrial area Parameters of the platform for neutralizing the waste
water	Limiting pollution to levels that do not cause a significant impact on water quality (surface water,	Removing surface water pollution due to sewage and storm water disposal Eliminating the pollution of	Implementing the provisions of the Plan of Water Management and Erosion Control Implement provisions of the	Specific indicators of water quality enabling: comparison with baseline and identification of evolving trends, project performance monitoring, verifying the effectiveness of the

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
	drinking water, groundwater)	groundwater and drinking water	Preparedness Plan for emergencies and accidental pollution	preventive measures / mitigation, improving the environmental management systems Indicators for monitoring the management measures: - Number of procedures developed and implemented specifying the activities they address; - Documenting the enforcement procedures for environment management. Technical indicators for monitoring the technical measures: - Systems for controlling emissions of pollutants in the water; - Effectiveness of systems for controlling emissions of pollutants into the water.
Air	Limitation of air emissions at levels that do not generate a significant impact on air quality in areas with sensitive receptors	Compliance with the legal limit for concentrations of pollutants on emission (directed stationary sources, mobile sources) Compliance with the emission limit values set by the competent environmental authority for IPPC installations Reducing pollutant emissions from unguided sources so that the pollution levels in areas with to comply with legal limit values.	Implementing the provisions of Air quality management plan that includes management and technical measures for all three phases of the project: construction, operation, closure / rehabilitation	Indicators for monitoring the management measures: - Number of procedures developed and implemented specifying the activities they address; - Documenting the enforcement procedures for environment management. Technical indicators for monitoring the technical measures: - The pollutant emissions control systems that are mounted; - The technical characteristics of stationary and mobile equipment;

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
				<ul style="list-style-type: none"> <li>- Geometrical characteristics of the costs of dispersion.</li> <li>Indicators for air quality monitoring and reporting:                             <ul style="list-style-type: none"> <li>- Concentrations of pollutants on emission for the sources routed;</li> <li>- Annual inventory of pollutant emissions;</li> <li>- Number and types of monitoring equipment for ambient air quality and meteorological parameters, placement;</li> <li>- Concentrations of pollutants (suspended particulates, dry and wet deposits, nitrogen oxides, carbon monoxide) in the ambient air;</li> <li>- The meteorological parameters;</li> <li>- Number of environmental reports issued annually;</li> <li>- Authorities whom were sent reports / environment briefings;</li> <li>- The way to inform / warn the public.</li> </ul> </li> </ul>
Noise and vibrations	Limiting the noise pollution at the sources in the areas with noise sensitive receptors Limiting the levels of vibration	Compliance with the legal limits to protect receptors sensitive to noise pollution Protecting the receptors sensitive to vibration	Implementation the provisions of the Management Plan for noise and vibrations	Indicators for monitoring the management measures: <ul style="list-style-type: none"> <li>- Number of procedures developed and implemented specifying the activities they address;</li> <li>- Documenting the enforcement procedures for environment management.</li> </ul> Technical indicators for monitoring the technical measures:

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
				- Measures to reduce noise and vibration levels implemented Noise levels at the receptors Vibration levels at receptors
Biodiversity, flora and fauna	Limiting the negative impact on biodiversity, flora and fauna	Conservation, protection, restoration and ecological rehabilitation Protecting rare species and habitats Monitoring of habitats and wildlife Promoting management ethics	Implementing the provisions of the Biodiversity Management Plan	Levels of habitat and species management in relation to the reference conditions Changes in surface of the habitats and species: annual mapping (distribution of habitats, population structure), monitoring wildlife species Planted vegetation corridors Landscaped areas of environmental protection
Cultural architectural and archeological heritage	Minimizing the negative impacts on cultural, architectural and archaeological heritage	Protecting and preserving the cultural, architectural and archaeological heritage Protecting the natural monuments	Implementing the provisions of the cultural heritage Management Plan	Actions of the Cultural Heritage Management Plan implemented
Human health	Protection of human health according to Order 119/2014	Maintaining the quality of the environment below the legal limit for protection of human health The economic objectives which, by the nature of their work, can pollute the atmosphere, are placed in industrial areas The industrial area will be set up so that pollutants do not exceed the maximum permissible concentration in the ambient air of	Implementing the provisions of social and environmental management plans and of the Order 119/2014	community infrastructure Medical services: staff access to medical services, number of visits Specific indicators for environmental factors (water, air, noise, vibrations, soil)

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
		the protected territories The operation of the installations is subject to monitoring the residual gas emissions into the atmosphere		
Road / Transport infrastructure	Improving road infrastructure, minimizing the impact of transporting the materials	Ensuring that the traffic inside and outside the industrial area is safe Upgrading the existing road infrastructure Reduction of pollution emissions generated by road traffic	Implementing the provisions of the zonal urban plan and the project that is the subject of this plan on the modernization of road infrastructure outside the industrial area, as well as building access and technological roads within the area The use of low-polluting vehicles	Component of the new road infrastructure in the area Indicators on the state of the roads Standard procedure for accident prevention and intervention on the transport of materials Deliveries of fuel / fuels and chemicals Transport trails for fuels / fuel, chemicals and waste Select carriers, their contractual terms and responsibilities regarding health and environment Protocols of communication with the drivers
Landscape	Minimizing the impact on the landscape	Maintaining to the extent possible, the continuity features of the terrain shape and minimizing the topographic changes Organization of systems of landscaping and construction so as to achieve continuity with the natural landscape and to create more aesthetic assemblies	Implementing the Plan provisions for closing and environmental rehabilitation Specific actions to reduce the impact on the landscape during construction and operation	Types and number of shares to mitigate the impact on the landscape during construction, operation and decommissioning Types and number of actions to environmental restoration in the closing stage Specific parameters for the closing stage, on the physical stability of the buildings, warehouses, basins, and on the biological stability of all sites
Soil / Land Use	Limit the negative impact on soil	Reducing soil degradation due to stripping activities, excavation, constructions associated with	Strict limitation of the uncovered surfaces and the storage ones Implementing the provisions of	Specific indicators for the land status and soil quality

Environmental factor / aspect	Strategic Environmental Objectives	Specific environmental objectives	Targets	Indicators
		building the infrastructure Diminishing soil pollution through proper technological waste disposal Reducing soil pollution from production activities and related activities	the Plan of Water Management and Erosion Control (that includes technological wastewater and rainwater collection and treatment) Implementing the provisions of the waste Management Plan	
Material values	Maximizing the use of existing materials	The use of advanced technologies Use in the greatest extent possible, of the local material resources (wood, aggregates, etc.) in order to reduce the costs and the environmental impact of transport protection of property	Implementing the provisions of the project on the proposed technologies Implementing project provisions on the supply of materials in three stages: construction, operation, closure / rehabilitation	Types and amounts of local materials used
climatic factors	Reducing the emissions of greenhouse gases	Reducing CO2 emissions from stationary and mobile sources	Implementing project provisions on the use of liquefied petroleum gas as fuel for stationary combustion sources, as well as on the use of mobile equipment and vehicles equipped with engines with reduced fuel consumption	Annual inventory of greenhouse gas with greenhouse effect on types of sources

## **6. Potential significant environmental effects**

### **6.1. Introduction**

Requirements of G.O. no. 1076/2004 ask that the significant environmental effects of the implementation plan subject to environmental assessment are highlighted. The purpose of these requirements is the identification, prediction and assessment of impacts of implementing the plan.

In the case of updating the Urban Area Plan and expanding the built-in area of the plan being evaluated in this report, there are a multitude of forms of impact on the environmental factors / aspects, impacts forms which show different magnitudes, duration and intensities. For the synthetic evaluation of the potential environmental impact, both in terms of relevant impact categories have been established allowing highlighting potentially the significant environmental effects of implementing the plan, respectively, of building the new project objectives.

To assess the impact on thirteen environmental factors / issues that are relevant, or to establish for each one a specific criteria series allowing to highlight, mainly, the significant impact.

Below are presented the impact categories and the criteria for assessing the impact.

### **6.2. IMPACT CATEGORIES**

The environmental assessment for plans and programs require significant impact on identifying environmental factors / issues of the provisions of the plan taken into account.

The significant impact is defined as "the impact of which, through the nature, magnitude, duration or intensity alters a sensitive environmental factor".

According to the requirements of G.O. no. 1076/2004, the potential significant effects on the environmental factors / issues must include the side effects, the cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects.

In order to evaluate the impact of the project activities that are subject to PUZ six categories of impact have been established. The impact assessment is based on the evaluation criteria set out in section 6.3 and was made for all environmental factors / issues set / determined to have relevance for the plan under review.

Assessment and prediction of impact have been carried out based on expert models and methods.

The basic principle considered in determining the impact on the environmental factors / issues consisted of the evaluation of proposals of the plan in relation to the environmental objectives set out in Chapter 5. As a result, both categories of impact, and the evaluation criteria have been established in compliance with this principle.

The impact categories are described in the table below.

### Impact categories

Impact category	Description
Significant positive impact	Long-term or permanent positive effects of the project's proposals on the environmental factors / issues
Positive impact	Positive effects of project proposals on environmental factors / issues
Neutral impact	Positive and negative effects that are balanced or have no effect
Insignificant negative impact	Minor negative effect on environmental factors / issues
Negative impacts	Short-term or reversible negative effects on the environmental factors / issues
Significant negative impact	Long-term or irreversible negative effects on the environmental factors / issues

### 6.3. CRITERIA FOR DETERMINING THE POTENTIAL SIGNIFICANT IMPACTS ON THE ENVIRONMENT

In order to identify the potential significant environmental effects of the plan provisions evaluation criteria have been established for each of the relevant environmental factors / issues and which were considered when setting the environmental objectives.

The criteria for determining significant potential effects on the environment are presented in the table below.

#### Criteria for determining potential significant effects on the environment

<i>environmental factor / aspect</i>	<i>Evaluation criteria</i>	<i>Comments</i>	<i>Significance of the impact</i>
Population	Forms of socioeconomic impact for the following areas: - Land, infrastructure and demography; - workforce; - social connections and quality of life; - access; - Economy; - Community safety; - Community comfort; Measures to mitigate and manage the impact	The project implementation will determine some forms of positive or negative impact on different duration, on the social and economic life of the community. The project implementation will increase the standard of living of the population.	The significance of the socioeconomic impact will be determined on the basis of expert evaluations

<i>environmental factor / aspect</i>	<i>Evaluation criteria</i>	<i>Comments</i>	<i>Significance of the impact</i>
Waste management	The amount of waste resulting from the activity Size and location of sites for storing the waste resulting from the activity Measures for waste management resulting from the activity in the three stages of project implementation: construction, operation, closure / rehabilitation Provisions of the management plan for household waste and industrial waste	The project implementation will cause some amount of technological waste that will require occupying land area and taking constructive measures and management for avoiding environmental damage and public health damage throughout the lifespan of the project and after closing and rehabilitation. Locating landfills is important because it achieved in the industrial area to avoid the use of other lands. The project implementation will result in the generation of assimilable household and industrial waste which will require good management not to affect the environment and human health.	The significance of the impact will be determined on the basis of expert assessments, taking into account the provisions of the project on the design of the facilities for waste disposal and the measures included in the waste management plan
water	Concentrations of pollutants in wastewater discharged into the environment compared with the limit values set by national legislation Systems and measures to reduce pollutant emissions into the environment.	The activities undertaken may have associated multiple sources which may cause pollution of surface and groundwater.	The significance of the impact on water quality will be determined on the basis of expert evaluations
Air	Concentrations of pollutants in the emissions from the directed sources and from the fixed and mobile sources in relation to the limit values provided by national legislation. Concentrations of pollutants in the emissions from IPPC installations in relation to the values that can be obtained by applying best available techniques (BAT). Systems and measures to control emissions of pollutants into the atmosphere from major sources and their effectiveness in reducing emissions / pollution levels.	Relevant concentrations of pollutants (NH <sub>3</sub> , TSP, PM <sub>10</sub> , NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , CO, heavy metals) in ambient air in areas with sensitive receptors (population, vegetation, ecosystems) in relation to values. The project implementation can generate appreciable amounts of pollutants (mainly NH <sub>3</sub> , TSP, PM <sub>10</sub> , NO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , CO) emitted into the atmosphere which, in the absence of adequate systems / measures to minimize / eliminate the impact can significantly affect the ambient air quality in the areas with sensitive receptors.	The significance of the impact on ambient air quality in areas with sensitive receptors will be determined on the basis of expert evaluations
Noise and	Systems and measures to	The project implementation	The significance of the impact

<i>environmental factor / aspect</i>	<i>Evaluation criteria</i>	<i>Comments</i>	<i>Significance of the impact</i>
vibrations	<p>reduce noise pollution and mitigate the effects of vibration.</p> <p>Noise levels in areas with sensitive receptors in relation to the limit values set by national legislation.</p> <p>Levels of vibration intensity that will not affect the wildlife in the protected area and the population of the villages near the industrial site limits and causing damage to the sensitive structures.</p>	<p>involves the use of equipment associated with high levels of acoustic powers and which, in the absence of appropriate mitigation measures, can generate high levels of noise in the areas with sensitive receptors.</p> <p>The project implementation involves generating activities whose vibration intensities in the absence of appropriate mitigation measures may affect the sensitive receptors.</p>	<p>of noise and vibrations in areas with sensitive receptors will be determined on the basis of expert evaluations</p>
Biodiversity, flora and fauna	<p>Changing the surfaces of the habitats</p> <p>Changes in the forest fund</p> <p>Habitat loss and changes</p> <p>Changes / destruction of plant populations</p> <p>Alteration of species and populations of wildlife</p> <p>Changing / destruction of animal shelters for growth, feeding, resting and wintering</p> <p>Measures for management of biodiversity</p>	<p>The project implementation may cause different impacts on biodiversity: direct, indirect, reversible, partially irreversible</p>	<p>The significance of the impact will be determined on the basis of expert evaluations</p>
Cultural architectural and archeological heritage	<p>Measures to minimize the impact and the protection measures, conservation and recovery of the heritage values</p>	<p>The project implementation will result in different impacts, positive or negative, on the cultural landscape.</p>	<p>The significance of the impact will be determined on the basis of expert evaluations</p>
Human health	<p>Environmental factors quality in relation to the specific limit values for human health protection (population within the impact area of the project).</p> <p>Measures to minimize the impact on the environment</p> <p>According to Order 119/2014, the economic objectives which, by the nature of their work, can pollute the atmosphere, are placed in industrial areas</p> <p>The industrial area will be set up so that pollutants do not</p>	<p>The project implementation cannot generate appreciable amounts of pollutants released into the environment which, in the absence of adequate systems / measures to minimize / eliminate them the quality of the environmental factors can be significantly affected in the areas with sensitive receptors.</p> <p>The project implementation may also lead to high levels of noise and vibrations in areas with sensitive receptors.</p>	<p>The significance of the impact will be determined on the basis of expert evaluations</p>

<i>environmental factor / aspect</i>	<i>Evaluation criteria</i>	<i>Comments</i>	<i>Significance of the impact</i>
	exceed the maximum permissible concentration in the ambient air of the protected territories The operation of the installations is subject to monitoring the residual gas emissions into the atmosphere		
Road infrastructure/ Transport	The new configuration and the constructive solutions of the road infrastructure in relation to the necessities of the project, traffic safety and protecting the sensitive receptors	The project implementation involves changes in the current configuration and upgrading its road infrastructure by building new access and technological roads Transportation of materials involves the use of vehicles with large capacities and a considerable traffic intensity, especially on technological roads, which will result in a slight contamination of the air quality, noise levels, and vibrations.	The significance of the impact will be determined on the basis of expert evaluations
Landscape	Changes to the landscape at regional level Changes to the landscape at local level Impacts on environmental components and ecosystems Mitigation measures	The project implementation will result in a significant impact on local level, on the landscape. In some perimeters, the landscape change will be permanent.	The significance of the impact was assessed by expert analysis on the system natural factors (resources and ecosystems) interacting with the factors of the socioeconomic system (anthropogenic influence) influenced by the external factors induced by the project
Soil	Potential sources of soil pollution during the three life stages of the project, the probable impact area. Disturbed soil surfaces and nature of the disturbance. Measures to reduce the impact.	The project implementation will lead to the production of various forms of impact on soil: the physical and mechanical, chemical, biological. The project provides a rehabilitation of land after closing the activities.	The significance of the impact will be determined on the basis of expert evaluations
Material values	Use of resources Efficiency of resources use Impact on Infrastructure recycling of materials property value	The project implementation involves the use of considerable quantities of materials for building the facilities. Use in larger measure of local resources will reduce the impact by shortening considerable distances for transporting materials.	The significance of the impact on resource use will be determined based on expert assessments. The significance of impacts from transportation of materials will be determined on the basis of expert assessments of air quality, noise and vibration.

<i>environmental factor / aspect</i>	<i>Evaluation criteria</i>	<i>Comments</i>	<i>Significance of the impact</i>
		Transporting the materials can cause a significant environmental impact.	
climatic factors	Emissions of greenhouse effect gases. Technical and management measures to reduce emissions of greenhouse gases.	The project implementation involves the operation of a renewable fuel burning source, resulting in emissions of gases that contribute to global warming. The main greenhouse gas that is emitted will be CO <sub>2</sub> , other gases with higher potential on greenhouse effect will be emitted in much smaller amounts.	The significance of the impact will be determined on the basis of expert evaluations

#### 6.4.CUMULATIVE EFFECTS

According to H. G. no. 1076/2004 it is necessary that, in assessing the environmental effects of the plan provisions, to be taken into account the cumulative and synergistic effects on the environment. Thus, the cumulative effects can occur in situations where several activities have insignificant individual effects, but together can generate a significant impact or, when several individual effects of the plan generate a combined effect.

In the case of the project subject to the urban plan that is being analyzed, are provided activities which will be held simultaneously in several blocks in the new industrial areas. The effects of these activities on the environment may be added or combined, generating a significant impact.

It is specified that the expert methods used to predict the impact took into account the worst case scenarios, considering the simultaneous performance of all activities involved in the project, even if this is unlikely to happen in reality. The impact assessment was carried out taking into account the cumulative and combined effects of the pollutants or the stress factors on the environmental factors / issues.

An example of this approach to the assessment, in which the cumulative effects result by default due patterns / prediction methods used, may be submitted for the environmental factor "air". Thus, the mathematical model used is a model which takes into account multiple sources of simultaneous emission of pollutants from different sites.

The fields of the pollutant concentrations resulting from modeling include, in every point, the cumulative contributions of all emission sources.

## **6.5. INTERACTIONS**

For situations where interactions between two or more environmental factors may be possible as a result of the implementation of the plan, the evaluation considered these potential interactions.

An example in this respect can be given for the environmental aspect "noise and vibrations". Thus, apparently, the noise level would be of interest only to human bodies because the limit values are established only for these receptors. However, noise can also affect other receptors, such as terrestrial fauna and material goods.

The environmental assessment was done taking into account all the methodological elements described above. The results of the environmental assessment are presented in Chapter 7 of this report.

## **7. POSSIBLE SIGNIFICANT ENVIRONMENTAL IMPACT INCLUDING ON HEALTH, IN A TRANS-BOUNDARY CONTEXT**

Evaluation of potential significant environmental effects generated by the project object of the analyzed plan was carried out in accordance with the methodology presented in the previous chapter.

Thus, for each of the thirteen environmental factors relevant to the plan, was conducted the prediction of the potential impact generated by the project activities using expert methods, measures to prevent / decrease have been implemented through the project, and was finally evaluated the residual impact, taking into consideration the evaluation criteria and categories of impact established. It is specified that the measures to prevent / mitigate the impact on the environment and economic - social factors are included in the environmental and social management plans and in the plans and procedures related thereto.

The results are summarized in the form of matrices developed for each of the / thirteen environmental factors / issues. Each matrix includes main forms for potential impacts, specific to that environmental factor, generated by the project activities, impact prevention / mitigation measures, the category / categories of impact in which the residual impact falls under, and the way the relevant environment objectives are met for the area. It is stated that for each of the evaluated environmental factors is indicated the specific impact management plan containing detailed measures for prevention / mitigation.

Also, a matrix was developed to assess the cumulative effects of pollutants / stress factors as well as interactions between two or more environmental factors as a result of project implementation.

The issues related to the risks of the project that is the subject PUZ have been analyzed.

### **7.1. Assessment of the potential effects on the environment that are relevant to the plan**

**Assessment matrix for the environmental aspect "Population"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Reducing the access to services of the local population, decreased quality of local services or competition on services predominantly due to the influx of workers and unemployed people from other areas	Employment policy priority for the local population	Significant positive	Complies with specific environmental objectives
Improving local services by increasing the demand for access and service quality from the workers, increased purchasing power that determines new investments	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Increasing diversity, and cultural and social revitalization, the emergence of new energies and initiatives due to the influx of workers from other areas, integrating them into the community	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Risk of disorders and cultural conflict with the locals due to the influx of workers from other areas.	Employment policy priority for the local population Code of conduct for employees Health policy and health training and awareness issues Risk of disorders and cultural conflict with locals due to the influx of workers from other areas.	Neutral	Complies with specific environmental objectives
Improving incomes and raising living standards, improving opportunities for personal development and family, including comfort, education, entertainment and future investments through rejuvenating, improving and diversifying the labor market	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Increasing opportunities to use the employability, developing their companies, filling gaps of services through adult education, vocational training, training in the workplace	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Improving basic and comon infrastructure and improvement of their associated health, improvement of access incentives or establishing in the area, improving the development opportunities due to increased comfort by renovating or building new infrastructure and services for Waste management Drinking water supply, power, sewerage, Transport.	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Cultural reviving and revitalizing introducing a new cultural dynamic as a result of exposure to other cultures, caused by the influx of	No mitigation measures required	Significant positive	Complies with specific environmental

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
foreigners in the area (Romanian or foreign citizens)			objectives
Stress and possible conflicting states as a result of changes, uncertainties and negotiations. Resentment, distrust, fear of the new and other cultures or foreigners.	Employment policy with priority for the local population.	Insignificant impact	Complies with specific environmental objectives
Increase in welfare of the owners / local operators, opportunity to liquidate assets or transforming the tangible assets into intangible assets, the possibility to invest in opportunities otherwise inaccessible for the locals due to increased demand for local services, infrastructure, including homes, land, other resources and local properties	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Construction or operation of the project will restrict temporarily or permanently discontinue access to land on which agriculture is practiced	Identifying all the access ways currently used by the community and implementing alternative solutions	Neutral	Complies with specific environmental objectives
Improving local authorities' budgets by increasing tax revenues, determining the increase of the possibilities of developing local civic service	Developing the capacity of local governments to plan and use adequately more resources Cooperation with local government to develop and co-finance projects	Significant positive	Complies with specific environmental objectives
Increased direct and indirect employment, creating jobs as a result of the present major investment tool	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Increase of the local economic activity after the start of the construction phase, the most active stage, including jobs, followed by a restructuring after the completion of the construction phase	SME development to improve the business climate in the long term to mitigate the decrease in economic activity that would follow completion of the construction phase	Significant positive	Complies with specific environmental objectives

**Assessment matrix for environmental aspect "Waste Management"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Affecting the quality of groundwater / surface water and soil quality by storing process waste	Design, construction and operation of the collection system in accordance with best available techniques	Neutral	Complies with specific environmental objectives
Risks of accidents related to the storage tanks by: losses from transport or over storage capacity spills, breaking.	Design and construction in accordance with national and international standards, training plan for emergencies and accidental spills	Insignificant impact	Complies with specific environmental objectives
Trans-boundary impact on water quality in the tailings and pumping systems spills	Monitoring the level of stored water	Insignificant impact	Complies with specific environmental objectives
Modification of land use of the project site and modification of the relief	Reducing the surface occupied by the landfill	Negative	Complies with specific environmental objectives
Affecting the quality of water and soil as a result of rainwater in area deposits	Collection and cleaning of the waters in the storage perimeters	Neutral	Complies with specific environmental objectives
Affecting the quality of soil and subsoil due to industrial waste management, construction / demolition and waste assimilable	Management of these types of waste in accordance with the legislation in force	Neutral	Complies with specific environmental objectives

**Assessment matrix for the environmental aspect "Water"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Affecting the water quality by storing household waste and other types of waste in waterways	Waste management plan Avoiding uncontrolled waste storage on site	Neutral	Complies with specific environmental objectives
Affecting the quality of water by discharging polluted sediments, particularly by attracting rainfall	Using best management practices on the disrupted parts	Significant positive	Complies with specific environmental objectives
Hydrological and hydrogeological conditions impact	Separate collection and discharge of the rainwater before discharge to surface water	Neutral	Complies with specific environmental objectives
Pollution of surface and ground acidic waters resulting waste storage	Separate collection and disposal of rainwater before discharge	Significant positive	Complies with specific

areas	to surface water		environmental objectives
Potential discharges of polluted sediments in the receptors, with water from precipitation during the closure / post-closure period	Restoring vegetation to prevent soil erosion, maintaining the control and monitoring system of the erosion process to stabilize the site	Neutral	Complies with specific environmental objectives
Reducing the intake of groundwater into surface waters during the closure / post-closure period	Maintaining permanently the treatment plants	Neutral	Complies with specific environmental objectives

### Assessment matrix for the environmental aspect "Air"

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Construction stage			
Air pollution with particles, NOx, CO, as well as SO2 and toxic pollutants generated by fuel combustion in heating, in areas with sensitive receptors (industrial area population of neighboring areas, vegetation, ecosystems)	Water splash of the materials (land, units), dust control program for unpaved road surfaces, in dry periods through truck tankers and using chemicals to set the dust Termination of dust generating activities in windy situations Monitoring and corrective / preventive actions as needed Setting and enforcing speed limits The inclusion of specifications on fuel efficiency on acquisition / leasing of motor vehicles and machinery, use of fuel with low sulfur content Planning procedures for regular maintenance of vehicles and mobile machinery Procedures to minimize the height of fall in handling / location of materials Using liquefied petroleum gas for heating	Negative for the impact with total particles in suspension in a small area, during construction Insignificant impact	Complies with specific environmental objectives
Exceeding the limit values for particulate emissions, exceeding the limit values for emissions of pollutants from vehicles / mobile machinery, potential pollution of air, in areas with sensitive receptors (population in areas surrounding the industrial area, vegetation, ecosystems), with particles, NOx, SO <sub>2</sub> , CO and other pollutants	Use of vehicles and mobile machines equipped with powerful motors that ensure emissions of pollutants below the legal limit	Insignificant impact	Complies with specific environmental objectives
Operating Stage			

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Air pollution particles, NH <sub>3</sub> , NO <sub>x</sub> , CO, as well as SO <sub>2</sub> and toxic pollutants generated by burning fuels in installations in areas with sensitive receptors (industrial area population of neighboring areas, vegetation, ecosystems)	Monitoring and corrective / preventive actions as needed Setting and enforcing emission limits Planning procedures for regular maintenance of vehicles and mobile machinery	Insignificant impact	Complies with specific environmental objectives

### Assessment matrix for environmental aspect "Noise and vibration"

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Affecting the sensitive receivers by noise levels above the permissible limits and / or vibration	Optimal placement of transport / access roads and other facilities Ambient noise and vibration monitoring and initiating corrective actions where necessary Purchase of equipment to meet the requirements of Directive 2000/14 / EC Equipping vehicles and mobile machinery with absorptive noise insulation shields Adequate management of the fleet and machinery to use a minimum number Incorporating hearing protection design features for designing the construction and installation of equipment to attenuate the noise Standard operating procedures for maintenance of the vehicles / machines Planning / delaying important deliveries during the day Limiting traffic speed	Insignificant impact	Complies with specific environmental objectives

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
	The use of buses to transport staff to reduce traffic Implementation, as appropriate, of measures to reduce noise at the receiver		

**Assessment matrix for environmental aspect "Biodiversity, flora and fauna"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Changing the surfaces of the habitats on the Site and the categories of use	Replanting and reintroduction of similar forms of land use, where possible during the closure / rehabilitation Full covering with vegetation in the closing stage / restoring the site stage, with native species, in order to restore the plant communities and the natural patterns	Negative in the stages of construction and operation	Complies with specific environmental objectives
Changes in of forest fund by age-related changes, composition of species and types of forest	Re-naturation of the area after closing Negative in the stages of construction and operation	Negative in the stages of construction and operation	Complies with specific environmental objectives
Habitat loss and changes	Rehabilitation of areas starting in the construction stage Re-naturation of the area	Negative in the stages of construction and operation	Complies with specific environmental objectives

**Assessment matrix for environmental aspect "Cultural architectural and archaeological heritage"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Potential affecting of the Cultural architectural and archeological heritage	Potential affecting of the Cultural architectural and archeological heritage Protocol for chance discoveries, the purpose of protection, conservation and presentation thereof	Insignificant positive	Complies with specific environmental objectives

**Assessment matrix for the environmental aspect "human health"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Affecting the human health as a result of project activities	Observance of the provisions of the Order 119/2014 for compliance with the Norms of hygiene and public health on the population's living environment Implementing measures to reduce air pollution, noise and vibration levels and those on preventing and combating emergencies Continuous monitoring of air quality and stopping the activities in cases where it is likely to surpass the limit values The economic objectives which, by the nature of their work, can pollute the atmosphere, are placed in industrial areas The industrial area will be set up so that pollutants do not exceed the maximum permissible concentration in the ambient air of the protected territories The operation of the installations is subject to monitoring the residual gas emissions into the atmosphere	Neutral  Positive	Complies with specific environmental objectives

**Assessment matrix for environmental aspect "Road infrastructure / Transport"**

potential impact	preventive / mitigation measures	Impact category	Environmental objectives compliance manner
Upgrading existing road infrastructure, with increasing traffic safety and construction of access and technological transport roads that will not affect the communities	No mitigation measures required	Significant positive	Complies with specific environmental objectives
Affecting the human health or the environment as a result of accidental releases of fuels, other hazardous liquids substances	Evaluation and selection of delivery services and transportation of good reputation The establishment of contractual clauses and responsibilities relating to health, safety and environment of suppliers and transporters Chemicals and oils will be purchased, transported and handled in accordance with the international and Romanian standards Monitoring deliveries of fuels and chemicals and daily reporting Strategic planning, scheduling and modifying delivery routes to avoid road crossing localities and to avoid heavy traffic Protocols of communication with the drivers Consultation with local authorities on the program and transport practices of chemicals, as well as alternate routes and other measures to minimize possible accidents due to vehicles transporting materials (fuels, liquid chemicals, oils) Cooperation scheme for interventions in case of accidental pollution / emergencies	Neutral	Complies with specific environmental objectives
Accidental pollution with municipal or technological waste as a result of accidents	Evaluation and selection of good reputation services for waste transport Strategic planning, scheduling and modifying waste transport routes to avoid road crossing localities and to avoid heavy traffic. Protocols of communication with the drivers Consultation with local authorities on the program of waste and transport practices, as well as alternate routes and other possible minimizing measures	Neutral	Complies with specific environmental objectives

**Assessment matrix for the environmental aspect "Landscape"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Local-scale landscape modifications by permanent modification of the relief geo-morphology	Architectural design appropriate for the integration of new topographical structures in the environment, as recommended by the standards in force	Insignificant impact	Complies with specific environmental objectives
Local-scale landscape modifications by changing the ratio of the natural landscape / anthropic stages of construction and operation, changing the ratio of land use categories and aesthetic value of the landscape in all phases of the project, the impact on protected areas under construction	Full covering with vegetation in the closing stage / restoring the site stage, with native species, in order to restore the plant communities and the natural patterns Specific measures to mitigate the visual impact in all project phases	Insignificant impact	Complies with specific environmental objectives
landscape modifications at a regional scale	Similar to those on a local scale	Insignificant impact	Complies with specific environmental objectives

**Assessment matrix for environmental aspect "Soil / Land Use"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Potential pollution by leakage of chemical reagents, oil or petroleum products	Developing concrete insulated spaces, fitted with collection systems for accidental leaks and, if necessary, with oil separators for chemicals / fuels unloading areas Storing chemicals / fuels as much as possible in covered areas equipped with retention tanks Neutral Respects the specific environmental goals	Neutral	Complies with specific environmental objectives

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
	Proper management of chemicals and fuels, including dangerous waste systems / materials for remediation		
Potential pollution generated by hazardous waste storage	Arranging a secured temporary storage of hazardous wastes, equipped with separate spaces, retention ponds, drainage systems to prevent the mixing of incompatible materials and capture any leakage; waste will be stored in appropriate containers.	Neutral	Complies with specific environmental objectives
Potential pollution generated by the collection and disposal of waste	Collecting in packaging materials / containers and disposal to a licensed place	Neutral	Complies with specific environmental objectives
Pollution generated by dust and metal charged particles emitted in the exhaust gases, due to the operation of vehicles and mobile machinery	Use of vehicles and mobile machinery fitted with engines that comply with the strictest emission standards Schedule for regular maintenance of vehicles and mobile machinery Implementation of dust control program on roads with traffic (spraying, applying chemical stabilizers)	Neutral	Complies with specific environmental objectives
Potential loss of land use as a result of industrial decorations	Storing overburden topsoil and using it for site rehabilitation Rehabilitation of the complete plant by covering with soil and revegetation, in order to return it to the original purpose or for other purposes	Neutral	Complies with specific environmental objectives

**Assessment matrix for the environmental aspect "Material values"**

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Increasing costs and environmental impact following the acquisition	Use in the greatest extent possible, of the local material	Positive	Complies with specific

and transport of building materials	resources (wood, aggregates, etc.) reducing both the costs and the Environmental impact due to Transport		environmental objectives
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### Assessment matrix for the environmental aspect "Climate factors"

<i>potential impact</i>	<i>preventive / mitigation measures</i>	<i>Impact category</i>	<i>Environmental objectives compliance manner</i>
Contribution to climate change through emissions of greenhouse gases	Using liquefied petroleum gas as fuel, installing high efficiency boilers to produce heat, to reduce fuel consumption, use of vehicles and mobile machines equipped with engines with reduced fuel consumption	Insignificant impact	Complies with specific environmental objectives

### Cumulative impacts and interactions

<i>environmental factor / aspect</i>	<i>Cumulative effects of the plan provisions</i>	<i>interacting environmental factor / issue</i>	<i>Comments on Potential interactions</i>
Population	The main impact forms are associated with improving social and life conditions of the population in the short, medium and long term. The project implementation plans and measures included in environmental and social management plans will result in a cumulative impact assessed as positively <i>significant</i> .	The soil / land use, cultural, architectural and archaeological heritage, material values	The project implementation will cause changes in land use in industrial area
Waste management	The main impact forms associated with land use change, potential pollution water (including trans-boundary) and of the soil. Compliance with the measures in the Waste Management Plan, the Plan of intervention in case of emergency / accident and to	Soil / Land Use, Cultural architectural and archeological heritage, Landscape, Material	Storage of waste generated by the activities carried out will cause changes in land use in the area

<i>environmental factor / aspect</i>	<i>Cumulative effects of the plan provisions</i>	<i>interacting environmental factor / issue</i>	<i>Comments on Potential interactions</i>
	<p>combat pollution and the Sustainable community development plan will result in a neutral cumulative impact <i>on</i> water and soil quality.</p> <p>Modification of land use area will generate <i>a negative impact during construction and operation</i>, which will be mitigated significantly in the post-closure stage following environmental rehabilitation and re-introduction of land in the natural circuit.</p>	values	
water	<p>The cumulative impact is caused by the discharge of treated wastewater and rainwater.</p> <p>In terms of implementing the Plan of water management and erosion control and other maintenance plans that ensure water quality within the legal limits, the cumulative impact will be <i>neutral</i>.</p> <p>Wastewater collection and treatment associated with works and appropriate management for all types of waste will cause a significant positive cumulative impact on surface water and groundwater quality.</p> <p>The general cumulative impact can be assessed as <i>positive</i>.</p>	Biodiversity, flora and fauna, Human health	<p>Water quality is essential for local flora and fauna</p> <p>Groundwater quality is important for health associated with works and appropriate management for all types of waste will cause a significant positive cumulative impact on surface water and groundwater quality.</p>
Air	<p>The cumulative impact on air quality of the sources of air pollutants will be well below the limit values for the protection of sensitive receptors, given that it will implement the measures foreseen in the air quality management plan. The cumulative impact is appreciated, however, as insignificantly <i>negative as it</i> brings some contribution to air pollution in the perimeters of sensitive receptors near the industrial zone.</p>	Biodiversity, flora and fauna, Human health, Landscape, Soil / Land Use, Road / Transport infrastructure, climatic factors	<p>Emissions of air pollutants, namely, air quality are important elements both locally, in terms of protection of human health, vegetation and ecosystems, and globally in terms of climate change.</p> <p>Emissions of dust and other pollutants, specific for the activities may influence the landscape as well as the soil quality (by submission).</p> <p>Road traffic specific pollutant emissions are dependent on the technical condition of the infrastructure. They determine the increase of the levels of air pollution in the vicinity of the traffic arteries.</p> <p>By implementing the measures of prevention / reduction of air pollution, the sensitive receptors will not be affected.</p>

<i>environmental factor / aspect</i>	<i>Cumulative effects of the plan provisions</i>	<i>interacting environmental factor / issue</i>	<i>Comments on Potential interactions</i>
Noise and vibrations	The cumulative impact of the activities carried on the noise and vibration levels will be below the limit values for the protection of the sensitive receptors, given that it will implement the measures set out in the Management Plan for noise and vibration. The cumulative impact is appreciated, however, as <i>insignificant negative</i> because the activities that will take place will make a contribution to levels of noise and vibration from the perimeters with sensitive receptors near the industrial zone.	Human health, Cultural architectural and archeological heritage, Road / Transport infrastructure	Noise and vibration levels can affect human health and / or condition of the building when they exceeds certain limits. Noise and vibration levels generated by road traffic are dependent on the technical condition of the infrastructure. Transport activities cause increased noise levels and vibration near the traffic artery. By implementing the measures to prevent / reduce the levels of noise and vibration, the sensitive receptors will not be affected.
Biodiversity, flora and fauna	The cumulative impact of the activities carried on biodiversity will consist of changes and habitat loss, which is considered as <i>insignificant</i>	landscape, Soil / Land Use	Implementing the provisions of the Biodiversity Management Plan will determine mitigation of the negative effects Implementation of measures for the establishment of compensatory ecological network and revegetation of the area after closing the activities will cause habitat restoration and diversification, with a positive <i>impact</i> on biodiversity.
Cultural architectural and archeological heritage	The cumulative impact is considered <i>significantly positive</i> .	Population, Landscape	Cultural architectural and archeological heritage may have influence with economic effects on the community. Also, this heritage has significance for the landscape features of the area and its surroundings.
Human health	The cumulative impact is <i>considered significantly positive</i> ..	Population, water, Air, Noise and vibrations	Human health is influenced by the living conditions, quality of water, air, noise and vibration levels. Specific considerations described above.
Road / Transport infrastructure	The cumulative impact associated with road infrastructure is considered <i>significantly positive</i> . The cumulative impact associated with transport is assessed as <i>neutral</i> .	Population, water, Air, Noise and vibrations, Human health, Soil / Land Use, climatic factors	Road infrastructure and traffic conditions influence the life in the communities, air quality, noise and vibration and through them, the human health. Road traffic generates a number of pollutants including the greenhouse gases. Transport of materials and in particular toxic and hazardous substances can affect human health or the environment (water, air, soil) as a result of any traffic accidents resulting in loss of substance.

<i>environmental factor / aspect</i>	<i>Cumulative effects of the plan provisions</i>	<i>interacting environmental factor / issue</i>	<i>Comments on Potential interactions</i>
Landscape	The only form of negative impact assessed as <i>significant</i> , on a local scale, is associated to the final alteration of the relief. Between land use and landscape there is a strong relationship for the area is assessed as <i>insignificantly negative</i> .	Cultural, architectural and archaeological heritage, biodiversity, flora and fauna, soil / land use, population	The landscape of an area also includes the cultural, architectural and archaeological heritage available to it. Biodiversity, flora and fauna are directly influenced by the natural elements of the landscape, which are essential components of habitat. Between land use and landscape there is a close relationship of interdependence. The impact on the landscape can generate some impacts on neighboring communities.
Soil / Land Use	The cumulative impact on soil and land use is seen as neutral by implementing the measures stipulated in: Waste Management Plan, the Plan for air quality, water management plan and Erosion Control Plan prepared for emergencies and accidental pollution	Population, Biodiversity, flora and fauna, Landscape, Material values	The impact on soil quality and land use and changes on the land can cause different impacts on the communities and material values (damage to property) as well as on biodiversity (habitat loss and changes). Environmental rehabilitation measures will lead to the reintroduction of similar forms of use
Material values	The cumulative impact on material values is assessed as <i>positive</i> .	Population, Soil / Land Use	The impact on property values can generate impacts on communities and on land use. Measures provided by the project on the use of local resources will have beneficial effects on the communities.
climatic factors	The cumulative impact on the climate is caused by emissions with greenhouse effect generated by stationary and mobile combustion sources. The impact is considered insignificant <i>negative</i> .	Air, road infrastructure / transport	The factors influencing the climate interact with air and transport due to the emissions associated with stationary combustion sources from the processing plant and the transport of raw materials and other materials.

## 7.2. Assessment of potential trans-boundary effects

In accordance with the provisions of Annex No. 1 of Law 22/2001 ratifying the Convention on Environmental Impact Assessment in a Transboundary Context, adopted at ESPOO on 25 February 1991 in conjunction with the fact that the proposed investment is the proximity of the Romanian-Bulgarian border, the developed investment falls under the scope of Article 6 "Integrated chemical installations."

The investment site is located at a distance of 1000 m from the state border between Romania and Bulgaria.

The sole environmental factor under monitor is air pollution, in a cross-border context. Other environmental factors are not affected, since the plant has a closed circuit, no wastewater is dumped into Arges or Danube, and soil is not affected directly.

Dispersion of air pollutants has been simulated, at various wind speeds, and the results show insignificant cross-border impact under normal operation conditions. Reduction of floating microparticles can be done by installing protective screens, with the purpose of reducing wind speeds around the plant. Also, reduction of air pollutants can be done by using high performance exhaust systems. Low operating temperature and high quality seals of oil processing equipment will hinder formation of VOC's. Of course, at this stage we are only considering theoretical (design) aspects, practical results will be based during testing and start-up of the plant, when environmental factors shall be measured and recorded.

## **8. PROPOSED MEASURES TO PREVENT, REDUCE AND COMPENSATE AS FULL AS POSSIBLE ANY ADVERSE EFFECT ON THE ENVIRONMENT CAUSED BY THE IMPLEMENTATION OF THE PLAN**

Implementing the plan is not without adverse effects on the environment, both during the implementation works and after, during the use of the objectives proposed, but the major difference is that the current pressures are uncontrollable, while through urban planning they get into a coherent process, perfectly controllable. Through the Urban Regulation are provided the admitted functions and restrictions for each case, the compliance being likely to reduce the pressure on the environment.

Each investment will comply with the current legislation, specialty studies will be required by the competent authorities.

## **9. EXPLANATORY MEMORANDUM FOR THE REASONS THAT LED TO THE SELECTED ALTERNATIVES AND DESCRIBING THE MANNER IN WHICH THE ASSESSMENT WAS MADE, DIFFICULTIES IN PROCESSING INFORMATION REQUIRED**

### **"ZERO" ALTERNATIVE OR "NO ACTION"**

The "zero" alternative was considered to provide a reference against other alternatives for various elements of the project that is the subject to the PUZ analyzed.

The main impacts associated with adopting "zero" alternative are:

- loss of major job opportunities;
- loss of investments made to date, resulting in loss of interest of the private investors, commercial banks and international financing institutions on future industrial development projects in the region and in Romania;
- loss of support for the development of a modern installation, consistent with the regulations in the field of reducing the amount of waste nationwide - recycling the used oil);

The most favorable situation for the area would be:

- dispose of solid economic opportunities and jobs;
- The environmental and social impact generated by the activity that will be developed and other major economic developments to be minimal;
- to have the capacity and technical resources necessary to remedy the occurrence of pollution.

To accomplish this (and prevent the negative social - economic impact generated by the failure to implement the project) requires a viable economic resource, capable of generating opportunities for jobs in significant numbers and sufficient income to enable solving environmental problems

In those below is presented a comparison of the forms of environmental impact corresponding to the "zero" alternative with the implementation of the project.

## **ALTERNATIVES REGARDING THE DEVELOPMENT OF THE PROJECT**

**The proposed** version leads to the following advantages:

- the existing roads will be modernized;
- new jobs will be generated;
- expansion of the town water collection and water distribution network
- achieving of a sewage system that provides routing of the wastewater to the treatment plant;
- will develop the power supply network to ensure a high degree of reliability and quality exploitation;
- applying a modern and efficient waste management system;
- introduction of new sorting systems at source and selective collection of recyclable materials.

for this plan, the following has been considered

- ✓ *Economic criteria* (namely the efficiency). The proposed solution for P.U.Z. shows the best results in terms of cost, lower compared to other alternatives; similarly, the maintenance costs are lower.
- ✓ *Social criteria* (namely the social acceptability). The P.U.Z. proposals show the best results in terms of protection of the human factor; positive impact on the residents is significant.
- ✓ *Environment criteria* (namely the environmental sustainability). The P.U.Z. proposals show insignificant effects on biodiversity, which is developed in appropriate assessment study which was approved by the EPA Calarasi. It is true that at first glance is an act of courage to build a factory for recycling used oil near Natura 2000 site, but the environmental monitoring conducted have shown that land will be preserved in its original shape and more than that will not bear degradation factors; no priority habitats exist in the area, so it does not destroy habitats, the bird species identified are not resident on site and were observed only in passage, most processes will be closed circuit. The investment brings environmental benefits by creating a refinery that will

*reduce the amount of waste of used oil nationwide. Through a strict monitoring program or there will be no significant adverse environmental effects.*

The proposals for the works designed from the P.U.Z. meet the technical norms in force. No other version of the design would have provided further environmental benefits compared with the chosen version.

The building materials will include simple materials generally used in such works. It is anticipated that traditional building materials and techniques will be used, although the final details depend on the manufacturer's technology. The technical solutions later proposed will have to take into account:

- the environmental conditions
- type and nature of the work,
- the possibility of using local materials,
- technical, functional usefulness, and the security of the proposed development,
- the facilities, the functional, geological, hydrogeological, hydrological, institutional characteristics of the area,
- the existing vicinities.

Through the specifications the manufacturer is recommended the use of modern equipment and machinery to comply with the technical requirements and the current European standards practiced in environmental protection. A recommendation will be made where the work spaces are limited to use mainly manual work to minimize the impact of the construction works.

## **10. MEASURES CONSIDERED FOR MONITORING SIGNIFICANT EFFECTS OF THE IMPLEMENTATION OF THE PLAN**

Economic and social development is a natural process from which derives the increased quality of life and environment when from the project are provided when all the measures of integration into the environment.

According to GD 1076/2004 monitoring the implementation of the plan or program, based on the program proposed by the older is considering the identification from the beginning of the significant effects on the environment as well as the unforeseen adverse effects in order to undertake corresponding remedial actions.

Fulfillment of the monitoring program on the environmental effects falls under the responsibility of plan or program holder.

Thus, it is advisable that the monitoring program of emission sources and environmental components likely to be affected comprises of three stages as follows:

**Stage I - Pre implementation plan** - to establish the environmental baseline status;

**Stage II - the installation of works - correction** (remedy) of the accidental pollutions and elimination of the sources;

**Stage III - Post implementation plan** - for comparing the state of the environment after completion of the work with the initial reference state, for observation and control of the new pollution sources emerged for rapid intervention where needed.

Given the specific conditions the main environmental factors that need to be monitored are:

Field of the significant effect	Monitoring measures
Air	<ul style="list-style-type: none"> <li>• Monitoring of emissions of air pollutants both in the execution of works for P.U.Z specific objectives, and in their operational phase.</li> <li>• Monitoring of emissions of specific pollutants in both stages, both in the execution and operation.</li> </ul>
Waste water	<ul style="list-style-type: none"> <li>• The monitoring indicators of quality of wastewater discharged and including them in the limits permitted by GD. no. 188/2002, amended and completed by GD no. 352/2005 or NTPA 002/2002.</li> <li>• Building pre-treatment plants</li> </ul>
Surface water	<ul style="list-style-type: none"> <li>• Monitoring quality indicators of surface water and compliance with quality classes</li> <li>• The establishment of protected areas of riverbanks (depending on the provisions of Romanian Waters authorities</li> </ul>
Soil	<ul style="list-style-type: none"> <li>• Monitoring soil quality and compliance with quality standards</li> <li>• Monitoring the implementation of selective waste collection.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• Monitoring landscaping in accordance with the provisions of P.U.Z ..</li> <li>• monitoring of vegetation planting and biotops</li> <li>• Monitoring of bird species in all periods of development</li> </ul>
Natural hazards	<ul style="list-style-type: none"> <li>• Monitoring of land areas with problems of de-structuration and maintenance</li> </ul>
Development of the administrative	

<p>area related to PUZ</p>	<ul style="list-style-type: none"> <li>• Establishment of a committee of initiative for launching the development programs provided in P.U.Z.</li> <li>• Starting public projects - private partnership or other forms of collaboration to obtain funds needed to develop the area.</li> <li>• Attracting funds from external programs.</li> <li>• All the investments which will be linked to water (adduction networks, drinking water distribution networks, sewer networks, wastewater pre-treatment plant, works of defense of the banks) will require water management permit on the basis of technical documentation prepared in accordance with regulations in force.</li> <li>• Implementing each project to be conducted in the PUZ will be made with requiring the Environmental Agreement from the competent authority for environmental protection.</li> </ul>
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Tables above represent the elaborator's considerations based on experience in the field illustrating the main environmental factors considered necessary to be monitored. The main environmental factors need to be considered monitored, periodicity, locations of monitoring points as well as parameters that need to be followed will be able to be negotiated by the beneficiaries with representatives of the Environmental Protection Agency.

## 11. NON TECHNICAL SUMMARY

Beneficiary of the investment - GREEN OIL AND LUBES SRL wishes to build a used oil recycling plant with a capacity of 200 tonnes/day. The development of this economic activity is also crucial against the background of the obligations undertaken by ROMANIA for waste management and waste recycling according to the European directives.

The current function of the site subject to this documentation is commercial and tourist port, according to the town planning documentation - PUG phase - developed and approved in 2013.

The objective of the investment is located within the limits of Oltenita town, Calarasi County. The address of the property is field 89, plot A5774. The area of the property in question (the property under review) is of 17.88 ha.

The investment site is located at a distance of 1000 metres from the state border between Romania and Bulgaria.

The distance from the Danube River is of 650 metres.

The distance from Arges River is greater than 300 metres.

In terms of altitude in the national system of elevation Black Sea 1975 the average altitude of the land subject to the investment is approximately 18.50 - 19.00 metres. The ground is uneven as there are sharp bumps and landforms, mostly created anthropogenically - holes, mounds etc. Also near the land, there is an archaeological site located at a distance of 24 m.

The used oil recycling plant will have a processing capacity of 200 tonnes/day which requires, according to the technological flow presented by the beneficiary, an annual processing quantity of approximately 66,000 tonnes of oils. Technology will be state-of-the-art by combining advanced technology of vacuum distillation with catalytic high-pressure hydrotreatment of the recovered oil.

Overall, the plant will ensure environment protection by processing approximately 66,000 tonnes/year of hazardous and toxic waste, producing high quality lubricants.

The components of the investment are the following:

- Object 1 - Processing factory;

Comprising of the distillation installation and the hydrotreatment unit. Estimated Sizes: 20 x 15 m for each facility.

- Object 2 - utilities platform;

It includes the tanks for storing raw materials (used oil), intermediate products and the finished product.

- Object 3 - Platform for loading / unloading;

Includes the access area for trucks for unloading raw material (used oil) and loading finished products. Norm capacity - tanks with a volume of 35m<sup>3</sup>. Estimated volume - 6312m<sup>3</sup> / month (75750m<sup>3</sup> / year), maximum traffic - 10

- Object 4 – Hydrogen plant;

Includes the H<sub>2</sub> production plant necessary in the hydrotreating process. The factory is located at a safety standard distance of minimum 10m from the plant. H<sub>2</sub> produced from water by hydrolysis. Estimated area 1054m<sup>2</sup>.

- Object 5 - pre-cleaning station;

It includes hydrocarbon separator that will treat rainwater collected from the inside roads. Estimated area - 347m<sup>2</sup>.

- Object 6 - PSI Station;

It includes household water necessary for the fire fighting equipment, including group of pumps and intangible water reserves. Estimated area - 275m<sup>2</sup>.

- Object 7 – - power connection (transformation post)

It includes the transformation point of MT / JT and the electrical connection of the objective. Estimated area - 1100m<sup>2</sup>.

➤ Object 8 - Control Room;

It includes the remote control unit of the plant, which will control, using a computer system, all the equipment of the objective. Estimated area - 125m<sup>2</sup>.

➤ Object 9 - laboratory

Includes the unit for analysis of raw materials introduced into the factory, and of the finished products resulting from the production process. Estimated area - 50m<sup>2</sup>.

➤ Object 10 - Cooling tower;

It includes the cooling equipment of process water circulating through the system. Estimated area - 365m<sup>2</sup>.

➤ Object 11 - Household water;

Includes connections to the water public network, pressurizing station and general distributor of process water. Estimated area - 6m<sup>2</sup>.

➤ Object 12 - maintenance workshop and storage for chemicals;

Includes the mechanical workshop necessary for the maintenance of the equipment in the factory and the storage for chemicals needed for functioning. Estimated area - 470m<sup>2</sup>.

➤ Object 13 - Management Building

Will accommodate the administrative staff of the objective and the changing rooms of the operational staff and the canteen of the unit. Occupied area is 450m<sup>2</sup>, the building will have three floors (GF + 2).

➤ Object 14 - inside roads;

Includes all circulations inside the interior, they will be paved roads with a minimum road width 7.00m, connection intersections will be achieved with norm rays for heavy-duty circulation (trucks). Occupied area of circulation is estimated at approx. 1.6ha.

➤ Object 15 - fencing.

Includes the fencing of the entire enclosure the objective with metal fence with a concrete base. The total length of fencing - approx. 1100 ml.

Description of the technological flow:

h. Dehydration

Dehydration is obtained by heating the oil used in a specialized equipment. This process results in 3,986 tonnes/year of vapours, consisting of a mixture of steam and volatile components. Water is then

condensed and sent to the collection system of chemically impure waters. The volatile components are used as fuel gases with low calorific power in the furnace of the facility or burnt in the flare.

i. Separation of liquid fuel (diesel oil)

The system consists of a vacuum evaporator. A quantity of 6,680 tonnes/year of fuel will be extracted from the used oil. This will be used in the furnace, but it will also supply the hydrotreater.

j. Oil separation

The basic product of the fuel separator will supply the film evaporators (Falling Film Evaporator & Wiped Film Evaporator). The separation will be carried out under vacuum.

The residue (bitumen) from the film evaporator, 9,320 tonnes/year, will be sold as road bitumen.

k. Hydrotreatment

The oil recovered from the film evaporators is treated with hydrogen in this facility to produce high quality base oils. The oil resulting from evaporators are treated in the presence of a special catalyst at a temperature of 360°C and pressure of 96 bar. The main resulting product is the oil base. The sulphur present in the raw material is extracted in the form of hydrogen sulfide (H<sub>2</sub>S). It will be extracted from the hydrogen flow by means of the amine absorption facility. A part of the recirculated hydrogen flow will be burnt as fuel in the furnace to keep the concentration of light hydrocarbons at the desired level.

l. Final fractionation

The hydrotreated oil is fractionated in the vacuum distillation column to produce base oils SN-150 or SN-500. In the same fractionation column light refinery streams are extracted to comply with the specifications of the products SN-150 and SN-500.

m. Hydrogen plant

The hydrogen required for the hydrotreatment plant is produced by the electrolysis of water. Oxygen will be released in the air.

n. Amine absorption facility

The mixture of hydrogen-rich gases, produced in the hydrotreater, also contains H<sub>2</sub>S. The gas is sent to the amines absorption plant for the removal of H<sub>2</sub>S. The hydrogen-rich mixture of filtrated gas is recirculated in the hydrotreater while H<sub>2</sub>S is burnt in the furnace or in the flare. The maximum quantity of H<sub>2</sub>S is 24 kg/h (192 tonnes/year).

1. Water quality protection:

Water supply will be made from the public network of SC ECOAQUA SA CALARASI OLTENITA BRANCH through two connections.

The water in the public network will be used:

for hygiene and sanitary purposes by the employees of the company

technologically (steam generation, cooling facility (water which is recycled)

at the laboratory (for rinsing the containers used in the lab)

sanitation of the premises (toilets and canteen - kitchen)

for cooking and dish washing - a canteen is planned to be arranged only for the employees of the company

for providing the fire fighting equipment - a reservoir for water supply of the fire hydrants is provided, if necessary.

The plant will mainly use demineralized water. The necessary quantity of steam is very low, mainly for cleaning the equipment when stopping. The vacuum pumps do not require steam like conventional ejectors, using state-of-the-art technology.

The cooling will be provided by a recycled water system with water cooled in a cooling tower. Any leakage of oil products will not affect the groundwater as there is a closed circuit.

The following categories of wastewater will result on site:

sewage water

water used for sanitation of the premises

from dish washing

from the laboratory (from rinsing of containers)

from gas stripping

from oil dehydration

The water used within the plant will pass through a softening/demineralization facility before use.

The domestic sewage together with the water resulting from the sanitation of the premises and the rinsing of the containers (from the laboratory) will be discharged through a R1 connection into the public sewerage system of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA.

The domestic sewage resulting from the dish washing (from the canteen) will pass through a fat separator after being discharged together with sewage water and water used for sanitation of the premises into the public sewerage system.

The wastewater resulting from the gas stripping and oil dehydration will pass through a treatment plant before being discharged into the public sewerage system.

Once a year, the water used for cooling the plant will also be discharged. Before discharging into the public sewerage system, the wastewater will pass through the treatment plant.

All liquid effluents will be treated in the wastewater treatment plant, which contains the separation of hydrocarbons, chemical and biological treatment.

Rainwater will pass through an oil separator and discharged into the public sewerage network through the R2 connection.

The distance from the first house will be approximately 1 km.

## 2. Protection of air quality:

There will be two sources of air pollution, namely the technological oven and the flare.

The plant will be equipped with a flare for incineration and dispersion of accidental gas emissions, as defined in the IPPC, the reference documents for the most advanced technologies in the field of mineral oil refineries.

The main effluent is hydrogen sulfide (H<sub>2</sub>S) which will be produced in the hydrotreater. The quantity will be very small, below 24 Kg/h. This will be absorbed by the amine plant, and then will be sent to the burner of the furnace or flare. The use of MDEA amines is compatible with BAT.

The heat generated by the oven where hot oil is heated (medium heat) will be generated by 1,188 tonnes/year of gas produced in the hydrotreater, completed by 3,212 tonnes/year of natural gas.

The emissions will be as follows:

NO<sub>x</sub>: (0.4kg/h) low NO<sub>x</sub> burners (John Zink, ZEECO or equivalent).

CO: (0.3kg/h) low using modern burners.

- CO<sub>2</sub>: (1000kg/h)
- SO<sub>2</sub>: (35kg/h)

There is a programme of prevention and detection of gas leaks in the plant.

The pumps will be equipped with seals that prevent leakage

The valves will be equipped with seals that prevent losses

All safety valves will discharge to the flare system.

Compressors will be equipped with the most modern seals that prevent leaks.

The flanges within the hydrotreater will be RTJ, which are the safest in terms of leakage.

The tanks for light products will be equipped with breather valves (instead of atmospheric vents).

The valves of the tanks and the non-condensable gases will be sent to the flare.

Chemically impure water will be stripped for H<sub>2</sub>S elimination, and then sent to the flare.

All burners will be NO<sub>x</sub> reduced burners.

The reactors in the hydrotreater require the replacement of the catalyst every 6 months. These catalysts will not contaminate the environment, but will be sent to the original provider for regeneration and recycling.

The project complies with the provisions of the Law 278/2013 on industrial emissions. In accordance with Annex 1 to the Law 278/2013, the activity of refining waste oils fits within art. "5. Waste management; point 5.1. Disposal or recovery of hazardous waste with a capacity exceeding 10 tonnes per day, letter j – re-refining or other reuses of the oils."

In accordance with the provisions of Annex No. 1 of Law 22/2001 ratifying the Convention on Environmental Impact Assessment in a Transboundary Context, adopted at ESPOO on 25 February 1991 in conjunction with the fact that the proposed investment is the proximity of the Romanian-Bulgarian border, the developed investment falls under the scope of Article 6 "Integrated chemical installations." The distance to the Bulgarian border is of 1,000 m.

### 3. Protection against noise and vibration:

Compliance with the noise level within the maximum acceptable values at the limit of the functional area, according to STAS 10009-88.

Noise level at the limit of the functional area:

- noise level equivalent Lech = 65 db (A)

- value of noise curve Cz = 60 dB

Noise level inside the functional area:

- noise level equivalent Lech = 70 db (A)

- value of noise curve Cz = 65 dB

avoiding as much as possible collisions, unnecessary impact in the operations: mechanical, loading - unloading of raw materials and materials etc.

organization of the work schedule in such a way as not to overlap the noise-generating operations;

all noise-generating equipment are located in indoors and are fastened to the base in order to reduce noise and vibrations.

#### 4. Protection against radiations

Pollution sources

The activity of the company does not involve the production or use of radioactive materials.

Environmental impact

Not applicable

Protection measures

Not required.

#### 5. Protection of soil and subsoil:

Pollution of soil and subsoil occurs because of the removal of the soil layer for the constructions.

There are various materials located on the soil which affect its quality due to the debris and dust remaining after use.

Another source of soil pollution is the spills of petroleum products, solvents, primers and paints and other technological waste to which can be added household waste deposited uncontrollably.

Soil protection is achieved by recovering the soil and temporary storage in order to be used in the ecological rehabilitation process of the operating area.

Proper storage of materials on specially designed surfaces and recovery of unusable scrap are also ways to protect the quality of soil.

Spills of petroleum products can be avoided by the permanent control and operative repair of the occurring defects.

Protection measures

Preliminary storage of waste in containers located in appropriate spaces and protected from bad weather (rain, snow).

Handling and storage of raw materials should be made according to the applicable legislation, in specially designed spaces, preventing the pollution of soil and subsoil.

## 6. Protection of terrestrial and water ecosystems:

The site under review is located in the immediate proximity of the site of Community importance RO SPA 0038 - Danube - Oltenita.

The site under review, according to Order no. 776/2007 is included in the European ecological network Natura 2000, on the site of Community importance RO SPA 0038 - Danube - Oltenita.

The ROSPA0038 Danube-Oltenita site is located on the Danube between km 451 and km 430, in the southern part of Romania, in the floodplain of the Danube.

It includes both the section of the Danube between Greaca, Cascioarele, Oltenita and the agricultural land that is part of the dammed area Greaca-Arges-Chirnogi. The geographic coordinates are 26° 29' 4" East longitude 44° 3' 48" North latitude. It covers an area of 5,927 hectares. The average altitude of the territory is 15 m. Most of the area is located in Calarasi County, and only 5% is in Giurgiu County.

The purpose of the designation of the ROSPA0038 Danube-Oltenita Site is the conservation of the wild bird species existing in its area, the maintenance/restoration of the favourable conservation status of the bird species of Community interest and their specific habitats.

The Special Protection Area ROSPA0038 Danube-Oltenita - hereinafter referred to as Site ROSPA0038 Danube-Oltenita - is a protected natural area of Community interest - the category of special protection area under Directive 2009/147/EC of the European Parliament and of the Council of 2009 on the conservation of wild birds designated by the Government Decision no. 1284/2007, declaring special protection areas for bird fauna as an integral part of the European ecological network Natura 2000 in Romania, as amended and supplemented by the Government Decision no. 971/2011.

The location of the proposed project is positioned at the distance of 7 m from the site.

The location of the proposed project is 100% contained in the area of Community interest, on its boundary in the Eastern part.

There are no habitats of Community interests on site. The characteristic habitat is of arable farmland and shrub vegetation.

In the period from 09.08.2012 to 31.11.2013, Otus Association in Odorheiu Secuiesc carried out a „Survey of inventory, mapping and evaluation of the conservation status of the bird species, as well as the identification and mapping of the limits of the area of special aquatic fauna protection ROSPA0006, ROSPA0038, ROSPA0048, ROSPA0077, ROSPA0058 and ROSPA0064” (code CPV 79311100-8 and CPV 71354100-5). Otus Association's observations were made on the Danube, namely the Arges River confluence with the Danube, thus the aquatic bird species were observed on the Danube and the Arges. The bird species from May can be considered, nesting birds, aside from the species of swallows and house martins.

The observations made by the beneficiary were made both on the Danube and Arges and in the strict perimeter of the future project.

No protected species and no nests have been observed in the development of future project. The species seen in perimeter were observed during the feeding period or passage.

For the appropriate assessment of the potential impact of the project on the site ROSPA0038 Danube Oltenita was involved a multidisciplinary team covering all aspects considered necessary to be studied.

Analysis and study of working conditions, assessment of its impact on the environment has led to the conclusion that the activity is justified in terms of economic development of the area where the objective is located.

The most important thing to mention is that the unit wants to implement a project in the field of recycling of waste oil.

In conclusion, the objective activity is a beneficial activity, with positive environmental impact by reducing the amount of waste nationwide.

The detailed recommendations are presented in this study. To this are added the additional elements consisting of:

light signalling of the site premises at night.

informing residents in areas closest to the objective on activities performed;

in accordance with the law, the administrative component is the competence of the beneficiary company.

For the location options chosen for the company, it will have to obtain legal authorizations.

As a preventive action, is recommended the creation of a headquarters for emergency situations to put the beneficiary's interests in compliance with those of the local authorities and the population;

The beneficiary company will have to conduct their own specific programs in terms of environmental protection, work safety, fire prevention.

To prevent accidents and damage, and for best results, it is necessary to make regular checks as follows:

transport means will be checked at the time periods stipulated by the law, and annual insurance contracts will be updated in time;

waste management will be conducted according to the requirements presented in this study, taking into account that during the period of operation and processing, the quantity of residues and their harmful effect, in case of mismanagement, could increase;

it is recommended to develop the graphs to make a connection between responsibilities regarding environmental protection on all factors that will contribute to achieving the objective: beneficiary, client, consultant, designer, etc. To the Romanian regulations relating to the organization of work in natural resource exploitation sites may be added the following recommendations:

- itinerary of transport vehicles should be studied carefully to avoid as much as possible the discomfort caused by noise and vibration;
- sound absorption systems must be checked and maintained regularly;
- storing materials must be such that they act as a noise barrier.

In terms of the Natura 2000 site, on the site have not been identified protected nesting species. Most protected species observed by monitoring in the area were passage species. The number of bird populations is reduced due to unfavorable conditions of the studied territory characterized by a strong human intervention.

During the operating period, the environmental impact will not be significant because the plant will have closed circuit and no wastewater will be discharged into the natural environment, nor any emissions into the air as they will be taken over by the exhaust system equipped with effective filters.

The impact of the operation phase on the integrity of Natura 2000 site is insignificant because there is no loss of habitats of conservation interest, there is no fragmentation of habitats, no losses occur on the surfaces of habitats used for the feeding, resting and breeding needs for the species of Community interest. Operational phase impact on the conservation status of species of Community interest for which the site has been declared Natura 2000 site is immaterial. The cumulative impact on the conservation status of species of Community interest in the Natura 2000 site is immaterial.

The impact of pollutant emissions on the environment and especially on species of Community interest is reduced due to the use of latest technology through installation of powerful filters, recirculation of the process water, installation of wastewater pre-treatment plant.

They will also continue monitoring the bird species throughout the project and after its implementation to track whether there will be changes in population dynamics and evolution of numbers.

Following the analysis of all types of impact factors on the environment, we conclude that the project "PUZ - Used oil recycling plant" has an insignificant impact on the environment, in the conditions of observing all the legal environmental obligations.

