"Waste Oil Recycling Plant, Oltenița Municipality, Calarasi County"

I. GENERAL INFORMATION

1. Holder of the activity

– name of the company: SC GREEN OIL AND LUBES SRL

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2. Certified author of the assessment study

The work has been prepared by:

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S.C. SMART ECOLOGIC CONSULTING S.R.L. is registered within the National Register of the Environment Protection Study Developers under heading 309.

3. Name of the project

"Waste Oil Recycling Plant, Oltenita Municipality, Calarasi County"

3.1. Location

The Oltenita Municipality is located in Lunca Dunarii (the Danube Meadow), at km 430, downstream from the confluence point of the Danube and the Arges rivers. The locality belongs, administratively, to the County of Calarasu, being the second locality, from the inhabitant number, economic, social and cultural activity point of view, after the Municipality of Calarasi.

The land is located in the private area of Oltenita and it is leased to the investment beneficiary – namely GREEN OIL AND LUBES SRL for the construction of the objective "Waste Oil Recycling Plant,

The investment objective is located in the built-up area of Oltenita, Calarasi County. The address of the real estate is strip 89, plot A5774, patch 1. The area of the real estate concerned (the studied real estate) is 17.88 ha.

The location of the investment is 1000 meter away from the state line between Romania and Bulgaria. The distance to the Danube river is 650 meters and the distance to the Arges river is more than 300 meters.

From the altimeter point of view in the national quota system Black Sea 1975, the average quota of the land subject to the investment is approximately 16.50 meters.

Likewise, near the land, there is an archaeological site 24 m away and Situl Natura 2000 is 7 m away from it - ROSPA0038 Danube-Oltenita.

The site of the future "Waste Oil Recycling Plant construction has the following neighbourliness:

- in the south, lot vacant from constructions and Tehnologica Radion;
- in the west - lot vacant from constructions;
- in the south-east: S.C. Densit S.R.L. - place of business of Soseaua Portului
- in the east: S.C. ECOAQUA S.A. Calarasi – The Oltenita Water Plant - In the north-east: S.C. Nutricom S.A.

3.2. Legal framework

Use of the land based on the Concession Agreement valid for a period of 49 years.

Project description and stages 4.1. Current situation

Currently, in Romania, there are no waste oil recycling installations - plants - on such a scale compared to the investment proposed by GREEN OIL

AND LUBES SRL. In this sense, currently, a very small quantity of the waste oil generated is collected for recycling purposes, at national level. As a case study regarding the economic impact and the impact on the environment regarding waste management –, namely waste oils, the automobile repair shops will be taken into consideration as examples. In this sense, a very small quantity of waste oils is recycled by approved firms. Most of the waste resulted – waste oils are either discharged to sewage system or to the water courses, generating an extremely important negative impact on the environment, or are burnt in craft facilities, having also an impact on the environment in the context of exhaust emissions. In case an economic operator appears, who will pay for the purchase of the waste oil quantity, the automobile repair shop will be directly interested to adhere to this economic flow, from both an economic and risk incurred point of view regarding the management of the waste resulted.

On the date this documentation is prepared, the site is vacant from any construction.

The site data are considered, taken from the approved topographical documentation (stereo 70).

The studied land is located in the built-up area of Oltenita locality, and it is categorized as an industrial land, by means of the Zonal Urban Plan approval of 2017.

The studied area will have a single Reference Territorial Unit (R.T.U.1) - industrial area (industrial construction and activities).

The area regulated from the urban planning point of view has 17,88 ha and on this area, the objective's premises are to be located.

The provision of green space legal requirement (26 sq.m./user, at minimum) will be done by means of green space development on the land areas vacant from any construction within the studied premises. At the level of the town planning local Regulation, the mandatory requirement of planting at least 1 tree for each 100 sq.m. vacant space will be provided.

The investment objective is located in the built-up area of Oltenita, Calarasi County. The address of the real estate is strip 89, plot A5774, patch 1. The area of the real estate concerned (the studied real estate) is 17.88 ha.

4.2. Developments proposed

The beneficiary of the investment - GREEN OIL AND LUBES SRL, part of a group of companies that have developed similar investments in other parts of the world (United Arab Emirates, Saudi Arabia, Malaysia, South Africa) have studied more scenarios regarding the site choice. In this sense, in the studied scenarios, several European countries, from central and Eastern Europe, have been included, at macro-regional level. Considering Romania's macro-economic stability within a long-term scenario, as well as the potential evolution within a regional geopolitical and economic context, Romania has been the one preferred to the detriment of other countries (Bulgaria, Serbia etc.).

The investor's advisers on finding the site for making the investment have taken into consideration several factors, among which, the most important ones are: the available area and the land legal status, vehicle access, railway infrastructure, existing utilities in the area and the possibility to connect to them, namely the power supply, the natural gas supply, the water supply and sewage network existing in the area. Likewise, an important factor has also been the manpower existing near the investment, human resource being essential from this point of view. Following the analysis of several possible sites for implementing the investment, the site located in the built-up area of Oltenita town has been chosen. In this sense, a very important factor in choosing this site has also been the possible connection – in a potential long-term scenario – to the shipping infrastructure (inland waterway shipping on both the Danube and the Arges rivers).

The land proposed for the investment is located in the built-up area of Oltenita town, being regulated by the town planning documentation – General Urban Plan stage– prepared and approved in 2013 and by the Zonal Urban Plan of 2017.

The studied land is located in the southern part of Oltenita Municipality, adjacent to two water courses – the Danube and the Arges rivers.

The land proposed for the investment is located outside the locality's construction area, at more than 770 meters from the first homes, thus it cannot affect the residential area through the presence of the industrial constructions and the ordinary activities.

From the point of view of the access to the land proposed for the investment, it is possible to access the site by means of the – DN 4 – state road, to the Oltenita harbour area (end of the road), following the harbour street (Strada Portului) for approximately 970 meters (rehabilitated road). In order to access the investment, one must take Strada Portului (the harbour street) on a rehabilitated road of approximately 200 meters.

The location of the investment is 1000 meter away from the state line between Romania and Bulgaria.

The Danube river is 650 meter away from the site.

The Arges river is more than 300 meter away from the site.

The maximum land occupancy percentage (M.O.P.) of constructions will be 60%, the remaining area being intended for green spaces and circulation.

From the altimeter point of view in the national quota system Black Sea 1975, the average quota of the land subject to the investment is approximately 16.5 meters.

The land, which is the object of this investment, is delimited by levees with a higher quota of approximately 20 meters, towards both the Danube and the Arges river.

The project's main objective and purpose:

The current function of the site in the area connecting the trade harbour and the tourist one has been modified into an industrial area.

The waste oil recycling plant will have a processing capacity of 200 tons / day, which implies, according to the technological flow presented by the beneficiary, an annual processing quantity of approximately 66.000 tons of oils. The technology will be a cutting-edge one, by combining the advanced distillation technology with the catalytic hydro-treatment under high pressure of the oil base recovered.

Overall, the plant will lead to the environment protection, by processing approximately 66.000t/year of hazardous and toxic waste, producing the base for the high quality lubricating oil.

The investment components are as follows:

Object no. according to the General Location Plan rev A	Construction		
	Intended purpose	**Type**	**Area**
1	Administrative building, having the following functions: - Administrative building (staff offices); - Conference room; - Boiler room.	Concrete construction	548 m_2
3	Fiscal scale platform		
6	Electric sub-station having the following functions: - Electrical panel room; - Cable basement; - Accumulator batteries room;	concrete construction	691 m_2
5			

	- Equipment room (control and measurement equipment); - Laboratory; - Locker room; - Technical room; - Boiler room.		
7	Fire safety tank park		
8	Fire safety pump house	concrete construction	140 m_2
9	Service water storage tank park		
10	Gas flaring installation		
11	Distillation installation	open, stage metal structure, for supporting and serving technological equipment	402 m_2
12	Hydro-treatment installation	open, stage metal structure, for supporting and serving technological equipment	348 m_2
13	Waste water treatment plant	technological platform	
14	Petroleum product day storage tank park		
15	Cooling tower		
16	Water demineralisation installation	closed metal structure, with insulated walls	80 m_2
18	The hydrogen installation	closed metal structure, with insulated walls	383 m_2
	Recycling hydrogen compressor	open metal structure, with roof, no walls	57 m_2
19	Utility area	closed metal structure, with insulated walls	645 m_2
20 & 25	Machine shop and catalyst and chemical substance storage	closed metal structure, with insulated walls	450 m_2
21	Petroleum product loading / unloading ramp	open metal structure, with roof, no walls	200 m_2
22	Uncovered parking	platform	
23	Petroleum product storage tank park		
24	Product pump house related to the Petroleum product storage tank park	open metal structure, with roof, no walls	268 m_2
26	Gate caretaker booth and fiscal scale operator	concrete construction	25 m_2
28	Hydrocarbon contaminated water household	technological platform	
29	Acid water household	open, stage metal structure, for supporting and serving technological equipment, no roof	150 m_2
30	SO removal installation$_2$:		

	Washing area (scrubber)	technological platform	600 m2
	Solid generating area	closed metal structure, with insulated walls	280 m2
31	Scraper plant	shed (steel structure with roof, no walls)	201 m2
32	Skid natural gas measurement	skid	

Functional description of the proposed construction:
Administrative building + locker room

The building has a 548 sq.m. area, while the ±0.00 quota of the inside floor is +0.40m as compared to the quota of the prepared land and +0.30m as compared to the sidewalk around the building.

The construction's number of storeys consists of the GROUND FLOOR, with a 5.00 m height over the attic and 5.50 m height over the handrail of the non-walk roof terrace.

The administrative area is accessed from the south side of the building, which is also the main access, and from the west side of the building. The building's ±0.00 quota is accessed from a sidewalk made all around the building by taking the access steps with 2 steps, having a 32 x 15 cm size.

The vehicle access is possible up to the parking located near the south side of the administrative building.

From the functional point of view, the construction will have, on the ground floor, an administrative area, a utility area for the administrative area and a locker room area. The administrative area consists of: reception, work area, offices, server room, conference room, PA and CMD/MD room, a kitchenette for the entire administrative area and the toilets. The cafeteria area consists, beside the cafeteria room itself, of a kitchen, storage rooms, boiler room, locker room and toilet and lavatory facilities. The locker room area consists of the two operator locker rooms, separated by gender.

Main intended purposes of the rooms:

ADMINISTRATIVE BUILDING + LOCKER ROOM - GROUND FLOOR			
No.	INTENDED PURPOSE	AREA USEFUL FLOOR AREA (SQ.M.)	USEFUL HEIGHT (M)
C02	WOMEN TOILET AND LAVATORY	7.72	3.30
C03	MEN TOILET AND LAVATORY	8.53	3.30
C04	WOMEN LOCKER ROOM	10.91	3.30
C05	MEN LOCKER ROOM	10.42	3.30
C06	CORRIDOR	6.77	4.25
C07	KITCHEN	68.85	4.25
C08	WASHER	13.56	4.25
C09	REFRIGERATOR AREA	11.21	4.25
C10	STORAGE ROOM	3.66	4.25
C11	STORAGE ROOM	4.62	4.25
C12	TECHNICAL ROOM	8.17	3.30
C13	HALLWAY	5.69	3.30
C14	WOMEN OPERATOR LOCKER ROOM	13.76	3.30
C15	MEN OPERATOR LOCKER ROOM	22.56	3.30
C16	FINANCIAL MANAGER	27.86	3.30
C17	SALES MANAGER	20.90	3.30
C18	THE MANAGER'S OFFICE	20.90	3.30
C19	OFFICE	21.37	3.30
C20	HALLWAY/ACCESS	52.80	3.30
C21	HALLWAY	5.39	3.30
C22	MEN TOILET	10.20	3.30
C23	WOMEN TOILET	8.20	3.30
C24	KITCHENETTE	10.63	3.30
C25	SERVER ROOM	14.88	3.30
C26	CORRIDOR	19.95	3.30
C27	WORK AREA	94.00	3.30
C28	CONFERENCE ROOM	66.22	3.30
C29	CMD/DM	33.70	3.30
C30	PA	15.12	3.30

The guard house

The building has a 25 sq.m. area, while the ±0.00 quota of the inside floor is +0.40m as compared to the quota of the prepared land and +0.30m as compared to the sidewalk around the building.

The construction's number of storeys consists of the GROUND FLOOR, with a 4.35 m height over the attic and 4,90 m height over the handrail of the non-walk roof terrace.

The building can be accessed from its east side, which is also the building's main access. The building's ±0.00 quota is accessed from a sidewalk made all around the building by taking the access steps with 2 steps, having a
32 x 15 cm size.

From the functional point of view, the construction benefits from a very clear organization, so that beside its intended purpose as a guard house, it is also equipped with a locker room, toilet and lavatory facilities and a kitchenette.

Main intended purposes of the rooms:

THE GUARD BOOTH - GROUND FLOOR			
No.	INTENDED PURPOSE	AREA USEFUL FLOOR AREA (SQ.M.)	USEFUL HEIGHT (M)
C01	GUARD BOOTH	26.70	3.10
C02	LOCKER ROOM	6.84	3.10
C03	TOILET	1.72	3.10
C04	KITCHENETTE	1.85	3.10

The electric set and substation building:

The building features a rectangle, with a 34 x 23 cm size. Ground floor + part of the floor. The building has a frame structure, just like the other buildings.
areas:

cable cellar = 430 sq.m. control
room = 38 sq.m. Showers and
locker rooms = 17 sq.m.
Equipment room =137 sq.m.
Laboratory; = 98 sq.m.

TECHNICAL ROOM =14 sq.m.
Showers and locker rooms = 28 sq.m.

Floor
switching room = 425 sq.m.
Battery room = 14 sq.m.

Construction system

Administrative building + locker room

The building's construction system will be made of reinforced concrete frames with 50 x 50 cm posts and 30 x 60 cm beams, while the foundation beams will be made of reinforced concrete, having a 50 x 70 cm size. The insulated foundation elements' depth will be at -2.40 m quota as compared to the ±0.00 quota of the building. The closures will be made of masonry with ceramic blocks, Porotherm type, 30 cm thick. The floor over the ground floor will be made of reinforced concrete, 15 cm thick, while the construction's roof will be a terrace type roof, with all the necessary waterproof system.

The external wall insulation has been proposed, using rigid foam-backed insulating plasterboard made of stone wool.

The guard house

The construction system of the proposed building is made of reinforced concrete frames with 40 x 40 cm posts and 30 x 50 cm beams. The foundation beams

proposed will be made of reinforced concrete, having a 40 x 60 cm size. The insulated foundation element's depth quota will be -2.40 m as compared to the building's ±0.00 quota. The closures will be made of masonry with ceramic blocks, Porotherm type, 30 cm thick. The floor over the ground floor will be made of reinforced concrete, 15 cm thick, while the construction's roof will be a terrace type roof, with all the necessary waterproof system.

The external wall insulation has been proposed, using rigid foam-backed insulating plasterboard made of stone wool.

External closures and internal partitions.

Administrative building + locker room

External closures

The ceramic block masonry proposed, Porotherm type, 30 cm thick, the 50 x 50 cm reinforced concrete posts and the 30 x 60 cm reinforced concrete beams, together with the 30 x 30 cm reinforced concrete secondary posts, which go along the external window and door openings and the reinforced concrete lintels proposed will be coated, on the outside, with rigid foam-backed insulating plasterboard made of stone wool and will be finished with decorative plaster.

The terrace-type roof proposed to be a non-walk roof will consist of all the layers necessary for a good insulation and waterproof.

Internal partitions

For the internal non load-bearing walls of the construction, drywall boards will be used, mounted on their specific metal structure, reaching a height of 15 cm and subsequently, mineral wool will be used for their sound proofing.

The partition walls of room C12 are excepted from this procedure – the Technical room, where these walls will be made of fire proof drywall boards, mounted on the same metal system and sound proofed with mineral wool. Likewise, for room C25 – the Server room, the partition walls will be made of drywall boards, mounted on a metal system, but their thickness will be 25 cm, because in this case

the thickness of the mineral wool will be double for a better sound proof against the noise that could result from the equipment used in this room.

For the administrative building, by means of the project topic, it has been proposed for the area intended for the administration itself to be separated by the cafeteria and locker room area. The wall parting these 2 areas, more precisely the wall on axis 3 will be made of ceramic block masonry, Porotherm type, 30 cm thick.

The guard house

External closures

The ceramic block masonry proposed, Porotherm type, 30 cm thick, the 40 x 40 cm reinforced concrete posts and the 30 x 50 cm reinforced concrete beams, together with the 50 x 50 cm reinforced concrete secondary posts, which go along the external window and door openings and the reinforced concrete lintels proposed will be coated, on the outside, with rigid foam-backed insulating plasterboard made of stone wool and will be finished with decorative plaster.

The terrace-type roof proposed to be a non-walk roof will consist of all the layers necessary for a good insulation and waterproof.

Internal partitions

For all the internal non load-bearing walls of the building, drywall boards will be used, mounted on their specific metal structure, reaching a height of 15 cm and subsequently, mineral wool will be used for their sound proofing.

Internal finishes

Administrative building +

locker room Flooring

- Granite tiles - 15 - 20 mm thick
  - to be mounted on a cement layer
  - to be mounted in: the space intended for the administrative area - offices,

reception, hallways, access area, work area, conference room

- to be mounted on the sidewalk and the access steps of the stairs

- Porcelain floor tiles - antiskid
  - hp baseboard = 5 - 7 cm
  - to be mounted on the wet slab
  - 2÷3mm joints – grout
  - to be mounted in: the toilets, in the locker rooms, in the storage rooms, in the boiler room, in the kitchenette

Internal walls

- Internal plasters mortar of lime - cement, with white emulsion paint
- Wall tile cladding - wall tiles, applied with adhesive (h = 2.10m)
  - 1mm joints, closed with humidity resistant grout
  - to be made in: the toilets, corridors, locker rooms, kitchenette

The guard house

Flooring

- Granite tiles - 15 - 20 mm thick
  - to be mounted on a cement layer
  - to be mounted on the sidewalk and the access steps of the stairs
- Porcelain floor tiles - antiskid
  - hp baseboard = 5 - 7 cm
  - to be mounted on the wet slab
  - 2÷3mm joints – grout
  - to be mounted in: the guard house, toilet, locker room, kitchenette

Internal walls

- Internal plasters mortar of lime - cement, with white emulsion paint

- Wall tile cladding - wall tiles, applied with adhesive (h = 2.10m)
  - 1mm joints, closed with humidity resistant grout
  - to be made in: the toilet

External finishes

Administrative building + locker room

On the outside, all the walls will be coated with rigid foam-backed insulating plasterboard made of stone wool, 100mm thick, on the entire area of the facade. Over the thermal insulation, an "oyster white" decorative plaster will be performed - RAL 1013 and a "sand yellow" one - RAL 1102, according to the facade colours.

The canopies above the building entrances will be finished with "sand yellow" - RAL 1002 - decorative plaster.

The guardrail of the terrace will be made of metal elements, painted in light grey.

The basement of the construction will be insulated with 5 cm thick extruded polystyrene boards, keeping the colours presented in the facades.

External stairs (building access)

- reinforced concrete steps, with coating on the stair and the stair riser, made of granite tiles

External stairs (terrace access)

- it will be made of metal, prefabricated, light grey

External joinery - window and door joinery will be PVC type, with 6 insulating chambers, dark brown, 40 mm thick triple glazing. The glass sheet will be mounted with a rubber weather strip, while the hardware and handles will be provided by the same manufacturer of the PVC joinery.

The guard house

On the outside, all the walls will be coated with rigid foam-backed insulating plasterboard made of stone wool, 100mm thick, on the entire area of the facade. Over the thermal insulation, an "oyster white" decorative plaster will be performed - RAL 1013 and a "sand yellow" one - RAL 1102, according to the facade colours.

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External joinery - window and door joinery will be PVC type, with 6 insulating chambers, dark brown, 40 mm thick triple glazing. The glass sheet will be mounted with a rubber weather strip, while the hardware and handles will be provided by the same manufacturer of the PVC joinery.

The cover

The terrace-type roof has been chosen, which will benefit from the entire waterproof and thermal insulation system, but also from the water abstraction, by means of special abstraction system.

Power supply

The power supply comes from the existing infrastructure. The electrical connection will be requested from the local electric energy provider.

The electric wiring will be done exclusively based on a project prepared by a certified specialty designer and only upon the electric energy provider's approval.

Sanitary installation

Water supply will come from the existing infrastructure. The disposal of waste water from this objective will be done by means of its own sewerage infrastructure, to the accumulating tank and the town's sewerage system.

The toilets and lavatories are provided with cold water and warm water produced by the boiler. The sanitary fixtures will be high quality fixtures.

For the execution of the water-sewerage installation, the beneficiary will address a certified designer, specialized in this field, who will prepare the technical documentation necessary to the execution.

The heating installation

The heat necessary for heating and preparing the warm meals necessary is obtained by means of a forced air boiler, located in the boiler room, specially built for this purpose. The boiler's equipment ensures its operation with a minimum 90% yield, due to the automation of the thermal energy production process.

The boiler, the equipment, the room where the boiler and its machinery are located will comply with the provisions of rule I13/1994 for this type of work.

The technological flow:

Generally, the procedure consists of recovering the main stock of lubes from the waste lubes by purifying them through hydrotreating process to produce API Gr.II + oils. The process is completed after doing the following operations:

Pre-treatment and filtration

ii. Dehydration and disposal of fuel oil

iii. Distillation

iv. Separating and stripping the oil form water

- The pre-treatment and filtration stage:

This stage implies the selection and filtration of the supply material, for an adequate functioning of the plant. The supply material from the tanks is first tested, to see which are its characteristics, because it must not contain compounds like waste lube, as requested by the local authority. The water content in the supply material of the waste lube must be as low as possible and must not exceed 10%.

The material received from the cistern is firstly filtrated with double basket (F-1001 A/B) at the microns dimension <1000 and then through the pump of the supply material collector (P-1001 A/ B) it reaches the storage tank of the supply material (T-1001A/B/C). According to the tank that reached the necessary retention time, the material shall be used to supply the refining plant with waste lube through the transfer pump of the supply material (P-1002). The self-cleaning filters are used for the subsequent filtration of the waste lube at the micron dimension <100. The supply material passes through the self-cleaning filter (SCF) (F1002 A/ B/ C/ D) placed in a parallel position, through the transfer pump of the supply material (P-1002), which operates at a 9,5 m3/h and 3,5 bar-g. The sludge from the self-cleaning filter (SCF) (F-1002 A/B/C/D) is sent back to the settling tanks. The caustic solution having a concentration of 40-48%, which is stored in the chemical substance (caustic) storage tank (T-1002), will be injected in the waste lube through the injection pump of the (caustic) chemical substances (P-1003) at a speed of 50-150 kg/ h at 3-3,5 bar-g to neutralize and maintain the PH of the waste lube.

The filtrate is then ready to be sent to the dehydrating section to remove volatile compounds and water (this procedure is described separately in the dehydration section). Once the water is removed from the waste lube,

it will pass through an exhaust heat exchanger, where the dehydration supply material recovers the heat by means of the exhaust heat exchanger (E-1001). The dried oil (dehydrated) is cooled until it reaches 90 °C in this changer by means of supply flow of waste oil, which passes through another part of the changer. As a final stage of the filtration process, the supply material goes then through the centrifuge, where most of the fatty components together with the fine particles are removed (<100 microns). because they can clog or pollute the surface of the evaporators in the distillation area. The solid particles in the centrifuge shall be directed to the settling tank. The filtrate in the centrifuge shall then be supplied in the fuel separation section.

- The dehydrating and recovery section of the fuel:
- Process area (dehydration):

In this section, the water in the supply material of the waste lube is eliminated. Like water, the components that have a boiling point lower than water will be separated from the waste lube. The pre-heater and the special vaporiser are used to completely dry the supply material. The supply material filtered by the self-cleaning filter (SCF) (F-1002 A/ B / C / D) in the filtration section will be pre-heated in a pre-heater/ changer (E-1006) at 120 degrees C by means of the liquid heater and will be treated in the specially conceived heavy distillation vaporiser E-1007. The supply material will be in the pipes and the heating will be ensured by the liquid heater.

A line recirculated from the transfer pump of the dried oil (P-1006) shall also be supplied towards the DH vaporiser (E-1007). This excess flow, together with the waste lube, will reduce to a minimum value the soiling of the tubes of the vaporiser and, thus, the maintenance time will be reduced. The process from the DH vaporiser (E1007) takes place in a lower void (100-200 mbar-a) and at a temperature of approximately 130-150 degrees C. The transfer pump of the dried oil (P1006) will be centrifuge pump with double mechanical sealing assembly. P1006 will work at 3.5 bar-g.

The low pressure (vacuum) in the system will be ensured and maintained by the vacuum pump (ring with liquid type). The void level can be controlled by means of a control valve installed at the vapour exhaust vent from the condensate storage vessel (V-1002). In the presence of the void system, the volatile products (solvents) have a boiling point lower than <130 degreesC and the water starts to vaporise in the tubes of the DH vaporiser (E-1007), and then the liquid and vapours shall be separated in the dry oil separator (V-1001).

The separated vapours will then be condensed in an upper WEF condenser (E1008) and the condensed liquid (oil + water) will be collected in the condensate storage vessel (V-1002). The cooling water will be used as a cooling agent in the WEF condenser (E-1008). The temperature of the output cooling water will have a maximum temperature of 40 degrees C, from all users. The condensed liquid will be sent further in the section of separating oil from water (1057-SCOP-P-PFD-1010-AX1), by means of the WLE centrifuge pump for oil condensate (P-1007) at 3,5 bar g.

This dried oil that is in the lower part of the dried oil separator (V-1001) will be sent in the centrifuging area (pre-treatment section), in order to separate the solids at the transfer pump of the dried oil (P-1006). The level in the dried oil separator (V-1001) and the storage vessel of the condensation (V-1002) will be controlled through a level tool and a control valve.

o Process area (separating the fuel):

From the centrifugal area of the pre-treatment section (1057-GOAL-P-PFD-1001-02-AX1) the filtered supply material enters the pre-heater of the oil fuel (E1011) at approximately 90 °C. In this section, the glycols and the fuels will be separated. The supply material is first heated at 260 degrees C by means of liquid heater in the pre-heater of oil fuel (E-1011) and then is sent to the specially designed vaporiser for oil fuel (E-1012).

The system works at a pressure of <100 mbar and at a temperature of approximately 260 degrees C. A re-circulation line from the oil re-circulation and transfer

pump (P-1011) is connected to the supply material before entering the vaporiser. The oil re-circulation and transfer pump (P-1011) is a centrifugal pump that has a double mechanical sealing. The oil will be evaporated and the mixed flow will be separated in the oil fuel separator (V-1006). The separated vapours will be condensed in an oil fuel condenser (E-1013), by means of the cooling water acting as a cooling agent. This is a special designed condenser and it will be in a vertical execution (U tube). The condensed oil will be collected in an oil fuel condensation storage vessel, placed in the lower part (V1007). The uncondensed liquid and vapours will be separated in the storage vessel of the condensed oil fuel (V-1007). The separated liquid in the storage vessel of the condensed oil fuel (V-1007) will be transferred to the water - oil separating section (AX1 1057 GOAL-P-PFD-1010-), to separate glycol from oil by means of the transfer pump of the condensate / oil fuel (P-1012). The transfer pump of the condensate / oil fuel (P-1012) is a centrifugal pump.

The separated liquid (oil) shall be transferred from the oil fuel separator (V1006) in the following stage, which is for the distillation process, in order to recover the main stock of lube by means of the oil re-circulation and transfer pump (P-1011). The oil recirculation and transfer pump (P-1011) is, also, a centrifugal pump that has a double mechanical sealing.

The thermal oil having a low temperature will be used for the circulation in the pre-heaters and vaporisers in the heavy distilled and fuel recovery section. The thermal oil supply temperature will be of approximately 5 bar-g and 300 degrees C and it will return to the pre-heater at 285 degrees C.

o Void system of the separation area of the heavy distilled and fuel:

The void in the fuel dehydration and separation shall be maintained by a pump intended for the separation of the heavy distilled and oil fuel (X-1001). For this purpose, a void pump with liquid ring (oil/ water) shall be used. The oil, as a sealing liquid, is recommended for the LRP operation,

because the oil has vapour pressures higher than water and will not vaporise when the void system operates. Also, together with the water, it could be necessary to install a cooling system for the same process. The condensation engaged from the oil fuel condensation storage vessel (V-1007) in the separation sections of fuel and water will be condensed by means of the engaging condenser. The engaged condensation is stored in the liquid separator. (V1011), and the condensed liquid is sent to the water -oil separation section (1057-GOAL-P-PFD-1010-AX1) through the captured liquid transfer pump (P-1016). The transfer pump for the captured liquid (P-1016) is a AODD-type pump.

The void pump with liquid ring pulls the vapours from the captured liquid separator (V-1011) and it evacuates them to the evacuation separator (V-1012). This pump needs a constant liquid flow to create a sealing inside the pump at a constant temperature. The liquid and vapours in the LRP will be separated in an evacuation separator (V1012). The gas component will be separated and the sealing liquid will be recirculated through the liquid re-circulation pump (P-1017), which will be a centrifugal pump. The sealing liquid circulates through the recirculation liquid (E-1017) and cools down before entering the LRP. The evacuation temperature of the oil will be approximately 50 degrees C. The cooling water will be used as cooling agent at the input vent and will have a 32 degrees C temperature, while the cooling water exhaust temperature will be 40 degrees C.

The residual gas in the void system will be sent to be evacuated in the liquid thermal heater.

- The distilled recovery section:

o Process area:

The oil in the oil re-circulation and transfer pump (P-1011) will be redirected to a pre-heater (E-1021), to further heat the oil, until it reaches a temperature of 300 degrees C by means of the thermal liquid. The thermal liquid system for this area will have high temperature, the entry of the thermal liquid in the pre-heater (E-1021) being of 365 -380 degrees C. (the beginning of the cycle - the end of the cycle). The output temperature of the thermal liquid shall be 350 - 365 degrees C. The pressure will depend on the type

of the thermal liquid used in the system. If a liquid with a low vapour pressure is used, then it will be necessary to use N2 in the system, to suppress form a thermal point of view the pressure of the vapours of the thermal liquid. The typical range of the work pressure for the thermal liquid having a high temperature is 6.5 bar-g - 9 bsar-g. This shall be later confirmed according to the type of thermal liquid used.

The preheated process oil will then enter the specially created distillation vaporiser (E-1022). The pipes of the vaporiser will be made of stainless steel (SS-304L). The middle distilled vaporiser (E-1022) works in void at approximately 512-512 mbar-a and at an input temperature of the thermal liquid of 365-380 degrees C. (the beginning of the cycle - the end of – the cycle).

The vapours generated in the middle distillation vaporiser ((E-1022) will be separated in the intermediary residue separator (V-1016). The liquid part is pumped from the lower part of the separator towards the next section, in order to recover the heavy distilled through the intermediary residue transfer pump (P-1012). The intermediary residue transfer pump (P-1012) is a centrifugal pump equipped with double mechanical sealing. The stainless steel construction SS-304L is recommended for this application.

The vapours separated in the intermediary residue separator (V-1016) will be condensed in the middle distillation condenser. The middle distillation condenser (E-1023) is a U-tube type vertical condenser. The vapours will be condensed and then refrigerated (up to 50 °C) in the middle distilled condenser, by means of the cooling water circulation. The condensed liquid will be collected in the storage vessel of the middle distilled (V-1017). The collected liquid oil is an intermediary product (oil of medium density) and it will be transferred to the intermediary storage tank to be sent to the next processing stage (hydro-treatment). The vapours that cannot be condensed will also be separated in the storage vessel of the medium distilled (V-1017).

o The vacuum system of the medium distilled recovery area:

The constant moderate void of 5-15 mbar will be maintained in the section by means of the void system. For this process, a void system with dry pump is recommended. An auxiliary device will raise the void level, increasing the flow and it will also help reduce the pressure value. Usually, the auxiliary devices operate a 1:10 ratio. Thus, the final load of the backup pump will decrease.

The vapours in the storage vessel of the medium distilled (V-1017) will pass through the condenser -2 (E-1024) to condensate the material taken from the process. This shall be collected in a vessel for the separation of the collected liquid (V-1018). The condensed oil is sent to the water-oil separation section (1057-GOAL-P-PFD-1010-AX1) through the transfer pump for the captured liquid (P-1023), which is a pump with a double pneumatic membrane.

The auxiliary pump (the blower)(B-1001) is used to obtain a bigger void and to evacuate it in the next captor of the void system. The auxiliary device will be a blower with profiled pistons. The vapours that go out of the blower are further condensed and cooled (up to 50 °C) in the engaging condenser 3 (E-1025). After this separator, the vapours that were not condensed will be pulled with void pump. A dry vertical cam void pump (X-1006) will be used in this process. This pump does not need to be circulated in a sealing liquid, as it is requested in the case of the void pump (X-1006) in the recovery area of the fuel and the heavy distilled.

The condensate captured at the evacuation vent of the void pump, that is V-1019, will be transferred to the water - oil separation section through the liquid transfer pump P-1024 (with double pneumatic membrane). The residual gas in the void system shall be sent to be evacuated in the thermal heater.

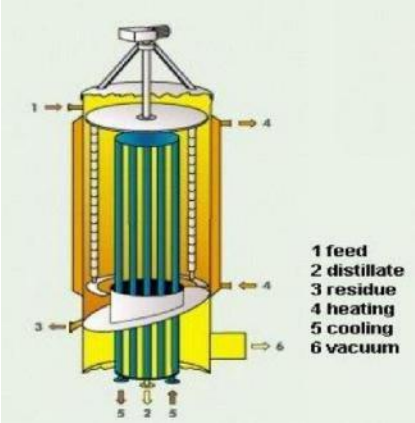
- The area for the recovery of the heavy distilled:

The residues in the medium distilled vaporizer (E-1022) are first heated up to 310-320 degrees C. in the heavy distilled pre-heater (E-1031), before being supplied in the vaporizers with film E-1032/1041/1051/1061. Within the plant, there are 4 film vaporizers. They are similar in execution and they will be operated in parallel, which is each film vaporizer will be constantly supplied by means of an intermediary

residue transfer pump (P-1021), located in the recovery area of the medium distilled. The input temperature (365 °C) and the output temperature (380 °C) of the thermal liquid will be used to heat through the area of the encasing of the pre-heater and the film vaporizers. The arrangement of the film vaporisers is explained below. The total advancement speed of the supply material of the pre-heater of heavy distilled (E-1031) will be 3600 - 4000 kg/h. The supply material will be equally supplied to the 4 film vaporisers at a speed of 900 -1000 kg/h to the film vaporisers E-1032/1041/1051/1061.

o Typical construction and work principles of the film vaporisers:

- supply material
- distilled
- residue
- heating
- cooling
- void



The film vaporiser (also called ”thin film vaporiser) consists of 2 main assemblies:

1. Heated body
2. Rotor

- The product enters above the heated area and it is evenly distributed by the rotor on the internal surface of the unit. Once the product begins to descend lower, doing a spiral on the wall, the arc waves developed by the rotor blades generate an extremely turbulent flow, leading to an optimum heat flow and a mass transfer.
- The volatile component evaporates quickly. The vapours move through the unit, either counter-current, either in the current, according to the application. In both cases, the vapours are ready for condensation or further process.
- The non-volatile components are evacuated at the exit towards the void system.
- The continuous wash of the non-volatile components by the waves minimizes the soil of the thermal wall where the product or the residue has the highest concentration.
- The combination between

a. Extremely short sedimentation time
b. The distribution of the short sedimentation time
c. Serious turbulence and

fast renewal of the surface allows the film vaporiser to adequately manipulate the liquids sensitive to heat, which are thick and favour sedimentation.

o Description of the process in the area of the film vaporisers:

The product obtained from the film vaporisers E-1032/1041/1051/1061 at 0,5-1 mbar-a and at 310-330 °C (process temperature) is a ”heavy distilled” and the by-product is ”bituminous residue” The condenser integrated in the film vaporiser will condense the generated vapours in the film vaporiser. The heavy- distilled is refrigerated and then condensed at 50 °C liquid in the heavy distilled condenser (E-1033/E-1042 / E-1052 / E-1062) heavy distilled and it is collected in the heavy distilled collection vessel (V-1021/1031/1041/1051), for the film vaporisers respectively (E-1032/1041/1051/ 1061). The heavy distilled collected is transferred to the storage tank of the heavy distilled / daily storage tank of the heavy distilled through the transfer pump of the heavy distilled (P-1031/1041/1051/1061) to be further processed in the hydro-treatment area 3,5 bar-g.

1031/1041/1051/1061. The pump will be equipped with gears on execution and it will work at 3,5 bar-g. The thermal liquid circulates in the area of the encasing at 365 degrees C. (the beginning of the cycle – end of the cycle) and the output temperature of the thermal liquid of the film vaporiser will be 350 degrees C. (beginning of the cycle – end of the cycle). The encasing of the film vaporiser will be covered on the inside with SS-316L/ SS-304L according to the standards of the producer. The layer of the encasing will be made of CS (SA 516 Gr. 70 N) during the execution.

The bituminous residue is a by-product of the vaporiser. It is collected in the residue tank (V-1022/1032/1042/1052) pertaining to the film vaporiser and it is transferred in the bituminous residue storage tank (at 3,5 bar-g), with the help of the residue transfer pump (P-1032/1042/1052/1062). The residue transfer pumps are pumps with gears. The bitumen pump must have an internal heating system. Remember that the bituminous residue can solidify below 110 degrees C. As a result, all lines and equipment pertaining to the exploitation of the bitumen must have a heating system (thermal traceability), to ensure their drainage and maintenance.

o Void system for the recovery area of the heavy condensed:

There are four film vaporisers in this process and each has its own void system. Below you will find typical information for the void functioning in the plant; still, these can be changed according to the requirements of the supplier and the type of system being used. The following description must be read for each film vaporiser.

The film vaporisers operate in a void of 0.1 - 1 mbar-a, which is maintained in the system by means of the void system. The residue storage tank vapours (V-1022/1032/1042/1052) pass through the engaging condenser (E-1034/ 1043/ 1053/ 1063) to capture the engaged liquids. The condensed liquid will be collected in the collected liquid condenser V(1023/1033/1043/1053) and will be transferred to the water-oil separation section (1057- GOAL-P-PFD-1010-AX1) by means

of the collected liquid transfer pump (P1033/ 1043/ 1053/ 1063). This will be a pump with a double pneumatic membrane.

In the heavy distilled section, in order to generate a void in the system is, usually, necessary to install 2 auxiliary devices + 1 support pump/ void pump. Still, this thing will be confirmed after discussing it with the seller.

The vapours in the separator for the collected liquid (V-1023/1033/1043/1053) will be transferred in the void pump by 2 void devices together with the coolers in the evacuation vent of each auxiliary device and the captors will be used to capture/ collect matter which can be condensed during plant operation. The condensed liquid will be collected and transferred to the separation section of water and oil by means of the captured liquid transfer pump (P-1024/1034/1044/1054).

The final void pump will be equipped with liquid ring. This needs a constant flow of liquid at a constant temperature to create the film inside the pump and, thus developing the void in the system. This thing will be ensured by means of a liquid re-circulation assembly.

The final void pump for the recovery of the heavy distilled (X1011/1016/1021/1026) is a void pump with liquid ring which sucks out the vapours in the captured liquid separator (V-1025/ 1035/ 1045/ 1055) in an intermediary captor and evacuates it in the evacuation separator (V-1026/1036/1046/1056). The void pump needs a constant flow of liquid at a constant temperature to create the film inside the pump and, thus developing the sealing liquid inside the pump. This thing will be ensured by means of a liquid recirculation pump (P-1035/1045/1055/1065) with the help of the circulating liquid cooler (E-1036/1045/1055/1065). The vapours extracted from the process will be evacuated at the unloading separator (V-1026/1036/1046/1056) together with the re-circulation liquid. The vapours will be separated here in the unloading separator (V-1026/1036/1046/1056). The separated vapours will then be sent to the thermal liquid heater room to be destroyed.

- The water-oil separator and stripping system.

In this section, the oily wastewater is sent to the water-oil separator (T-1011) and it works on the gravity difference principle. Due to the difference in gravity, the oil will float on the surface of the water. The specially designed internal components will act as a coalescer and, thus, big drops of oil will be formed. Thus, the efficiency of the oil and water separation is increased.

The individually separated oil and water in the storage tank of the oil fuel (V-1061) and in the tank for the wastewater (V-1062). The collected oil will be transferred trough the fuel transfer pump (P-1071) to the oil fuel storage tank and the water in the storage tank for wastewater (V-1062) will be transferred for stripping by means of the intermediary transfer pump for wastewater (P-1072) to remove the dissolved impurities.

For the stripping of the chlorinated compounds, which are lighter and have more ammonium, H2S and of the mercaptans etc. to take place, this must pass through stripping installation for wastewater (C-1001) and through the pre-heater. The wastewater is heated at 60 °C, before entering the column so that it can be stripped. Temperature is an important parameter for the separation; as a result, the water must be heated with the help of the pre-heater to have an efficient separation of the dissolved impurities. The wastewater is transferred through this system by means of P-1072 (the intermediary transfer pump for wastewater) In the wastewater stripping installation (C1001), the air passes through the sealing layer in the column to extract the components in the waste water. Then the water is transferred to the wastewater treatment system through the wastewater transfer pump. P-1073). The wastewater cooler (E-1072) of the cooler installed in the middle will cool the water at 50 degrees C. The waste water transfer pumps (P-1073/1072/1073) are centrifugal. The oil and water transfer pumps work at 3,5 bar-g.

The residual gas form the upper part of the water-oil separator (TK-1011) and from the stripping installation (C-1001) will be eliminated in the room of the thermal liquid heater.

The safety valves are installed on all critical equipment to protect them against over-pressurization, fire and other safety-related scenarios. The evacuation vents of the safety valves are connected to the management system of

emergency situations (flame system). The liquid will be captured in the KO vessel and the gas will be eliminated/ oxidized through the burner.

From the installation point of view, within the investment, the following installations and equipment will be used:

- For the technological flow involving hydro-treatment:

	Columns, vessels and reactors
1	*Fraction column*
2	*MDEA Absorber (amine)*
3	*MDEA Re-generator (amine)*
4	*Expansion vessel for the hydro-treatment supply*
5	*Low pressure separator*
6	*Expansion vessel for the re-circulation compressor*
7	*High, cold pressure separator*
8	*High, hot pressure separator*
9	*Expansion vessel for the supply compressor*
10	*Expansion vessel for the void pump*
11	*Water injection vessel*
12	*Neutralizer injection vessel*
13	*Corrosion inhibitor injection vessel*
14	*Atmospheric vessel*
15	*Heat transfer oil tank*
16	*Expansion vessel for heat transfer oil*
17	*Liquid fuel vessel*
18	*MDEA absorber supply tank*
19	*Re-generator reflux vessel*
20	*MDEA vessel*
21	*Expansion vessel for the flare system*
22	*Reactor*
23	*Reactor*
24	*Hydro-treatment main reactor*

	Furnaces
25	*Furnace*
	Pumps
26	*Hydro-treatment supply pumps*
27	*Fraction pumps*
28	*Recontact pumps*
29	*Heavy fraction dehydration supply pump*
30	*Light fraction pumps*
31	*Fraction vacuum pumps*
32	*Supply pumps*
33	*Water injection pump*
34	*Neutralizer injection pump*
35	*Corrosion inhibitor injection pump*
36	*Vacuum condensate pump*
37	*Heat transfer oil circulation pump*
38	*Heat transfer oil filling pump*
39	*Light amine pump*
40	*Amine re-generator re-boiler pumps*
41	*Flare system pumps*
	Compressors
42	*Re-circulation compressor*
43	*Hydrogen supply compressor*

	heat exchangers
44	*Supply changer*
45	*Reactor supply heater*
46	*Fraction supply heater*
47	*Recirculated gas cooler*
48	*Finite product cooler*
49	*Main reactor supply heater*
50	*Supply vessel beam*
51	*Distillation light fraction cooler*
52	*Fraction condenser*
53	*Hydrogen cooler*

54	*Hydro-treatment supply re-heater*
55	*Supply gas cooler*
56	*Light amine cooler*
57	*Amine re-boiler*
58	*Regeneration condenser*
	Filters
59	*Hydro-treatment supply filters*
60	*Product filters*
61	*Heat transfer oil filters*
62	*Cartridge filter*
63	*Active carbon filter*
64	*Particle mechanical filter*
65	*Flare system*
	Complete modules
66	*Amine additive injection module*
67	*Hydrogen production unit*

- For the technological flow involving hydro-*treatment:*

		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 device*	*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 fraction condenser*	*heat exchanger*
4	*Dehydrated oil separator*	*Vessel*
5	*Condensate collection vessel*	*Vessel*
6	*Dehydrated oil transfer pump*	*Pump*
7	*Water and light fraction condensation pump*	*Pump*
	1057-GOAL-P-PFD-1003	
1	*Liquid fuel pre-heater*	*heat exchanger*
2	*Liquid fuel evaporator*	*heat exchanger*
3	*Liquid fuel condenser*	*heat exchanger*
4	*Liquid fuel separator*	*Vessel*
5	*Liquid fuel collecting vessel*	*Vessel*
6	*Re-circulation and oil transfer pump*	*Pump*
7	*Liquid fuel transfer pump*	*Pump*
	1057-GOAL-P-PFD-1004	
1	*Supply condenser*	*heat exchanger*
2	*Recirculated liquid cooler*	*heat exchanger*
3	*Liquid separator*	*Vessel*
4	*Exhaust separator*	*Vessel*
5	*Liquid transfer pump*	*Pump*
6	*Liquid circulation pump*	*Pump*
7	*Void pump for the dehydration area*	*Pump*
	1057-GOAL-P-PFD-1005/01	
1	*Intermediate fraction pre-heater*	*heat exchanger*
2	*Intermediate fraction evaporator*	*heat exchanger*
3	*Intermediate fraction condenser*	*heat exchanger*
4	*Intermediate waste separator*	*Vessel*
5	*Intermediate fraction collection vessel*	*Vessel*
6	*Intermediate waste transfer pump*	*Pump*
7	*Intermediate fraction transfer pump*	*Pump*
	1057-GOAL-P-PFD-1005/02	
1	*Supply condenser-2*	*heat exchanger*
2	*Supply condenser-3*	*heat exchanger*
3	*Liquid separator -2*	*Vessel*
4	*Liquid separator -3*	*Vessel*
5	*Booster for the intermediate fraction recovery area*	*Pump*

6	*Wine pump for the intermediate fraction recovery area*	*Pump*
7	*Liquid transfer pump - 2*	*Pump*
8	*Liquid transfer pump - 3*	*Pump*
	1057-GOAL-P-PFD-1006/1	
1	*Heavy fraction pre-heater*	*heat exchanger*
2	*Film evaporator-1*	*heat exchanger*
3	*Evaporator heavy fraction condenser*	*heat exchanger*
4	*heavy fraction collection vessel*	*Vessel*
5	*Waste vessel for the film evaporator*	*Vessel*
6	*Heavy fraction transfer pump*	*Pump*
7	*Residue transfer pump*	*Pump*
	1057-GOAL-P-PFD-1006/2	
1	*Supply condenser-4*	*heat exchanger*
2	*Supply condenser-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	*Exhaust separator*	*Vessel*
8	*Void booster-2*	*Pump*
9	*Void booster-3*	*Pump*
10	*Void pump – for heavy fraction recovery*	*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 fraction collection vessel-2*	*Vessel*
4	*Heavy fraction collection vessel-2*	*Vessel*
5	*Heavy fraction transfer pump-2*	*Pump*
6	*Residue transfer pump-2*	*Pump*
	1057-GOAL-P-PFD-1007/02	
1	*Supply condenser-6*	*heat exchanger*
2	*Supply condenser-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	*Exhaust separator*	*Vessel*
8	*Void booster-4*	*Pump*
9	*Void booster-5*	*Pump*
10	*Void pump for heavy fraction recovery-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 fraction collection vessel-3*	*Vessel*
4	*Heavy fraction collection vessel-3*	*Vessel*
5	*Heavy fraction transfer pump-3*	*Pump*
6	*Residue transfer pump-3*	*Pump*
	1057-GOAL-P-PFD-1008/02	
1	*Supply condenser-8*	*heat exchanger*
2	*Supply condenser-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	*Exhaust separator*	*Vessel*
8	*Void booster-6*	*Pump*
9	*Void booster-7*	*Pump*
10	*Void pump for heavy fraction recovery-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 fraction collection vessel-4*	*Vessel*
4	*Heavy fraction collection vessel-4*	*Vessel*
5	*Heavy fraction transfer pump-4*	*Pump*
6	*Residue transfer pump-4*	*Pump*
	1057-GOAL-P-PFD-1009/02	
1	*Supply condenser-10*	*heat exchanger*
2	*Supply condenser-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	*Exhaust separator*	*Vessel*
8	*Void booster-8*	*Pump*
9	*Void booster-9*	*Pump*
10	*Void pump for heavy fraction recovery-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	*Stripping pre-heater*	*heat exchanger*
2	*Hydrocarbon separator*	*Vessel*
3	*Liquid fuel recovery vessel*	*Vessels*
4	*Waste water recovery vessel*	*Vessels*
5	*Waste water stripping column*	*Column*
6	*Liquid fuel transfer pump*	*Pump*
7	*Waste water intermediate transfer pump*	*Pump*
8	*Waste water transfer pump*	*Pump*
9	*Waste water cooler*	*heat exchanger*

The technological process and effluent stages:

a. Dehydration

Dehydration is obtained by heating the waste oil in specialised equipment. From this process, a number of 3986 t/ year vapours will result, consisting of a mixture of steam and volatile components. The water is then condensed and sent to the chemically impure storage system. The volatile components are used as gas fuel with low calorific power, in the furnace of the installation or burnt.

Input: 66.666 t/year waste oils

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 62.680 t/year dehydrated waste oil, 3986 t/year wastewater

b. The separation of the liquid fuel (diesel fuel).

The installation consists of a vacuum evaporator. A quantity of 6680 t/ year will be extracted from the waste oil. This will be used in the furnace, but it will supply the hydro-treatment installation.

Input: 62.680 t/year dehydrated waste oil

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 56.000 t/year supply with film evaporator, 6680 t/ year liquid fuel

c. Oil separation

The main product for the fuel separator will supply the film evaporators (Falling Film Evaporator & Wiped Film Evaporator). The separation is made under vacuum. The residue (bitumen) form the film evaporator, 9320 t/ year will be sold as road bitumen.

Input: 56.000 t/ year

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 46.680t/year from the film evaporators, 9320 t/year bitumen

d. Hydro-treatment

The oil recovered from the film evaporators is treated with hydrogen in this installation to produce the high quality oil base. The oils from the evaporators are treated in the presence of a special catalyst, at a temperature of 360 C and at a pressure of 96 bar. The main resulted product is the oil base. The sulfur in the raw material is extracted under the form of hydrogen sulfide (H2S). This will be extracted from the hydrogen flow with the help of the amine installation. A part of the re-circulated oxygen flow will be burnt as fuel in the furnace to maintain the light hydrocarbon concentration at the desired level.

Input: 46.680 t/ year from the film evaporators, 3624 t/ year hydrogen

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 45.624 t/year hydro-treated oil base, 680 t/year gases rich in hydrogen, used as fuel in the technological furnace.

e. Final breakage

The hydro-treated oil is broken into the distillation column to produce oil bases with the degrees SN-150 or SN-500. In the same breakage column the light breakages are extracted to meet the specifications of the SN-150 and SN-500 products.

f. The hydrogen installation

The hydrogen necessary for the hydro-treatment installation is produced through water electrolysis. The resulted oxygen will be released into the air.

Input: 4.285 t/ year demineralized water

Utilities: electricity, cooling water.

Products: 360 t/ year hydrogen

g. Amine installation

The gas mixture rich in hydrogen, produced in the hydro-treatment reactors, also contains H2S. The gas is sent to the amine installation to eliminate H2S. The filtered gas mixture rich in hydrogen is subsequently recirculated in the

hydro-treatment installation, while the H2S is burnt in the furnace or in the flare system. The maximum quantity of H2S is 24 kg/ h (192 t/ year).

4.3. Providing utilities

4.3.1. Access to the area

From the point of view of the access to the land proposed for the investment, it is possible to access the site taking the – DN 4 – state road, to the Oltenita harbour area (end of the road), following the harbour street (Strada Portului) for approximately 970 meters (rehabilitated road). In order to access the investment, one must take Strada Portului (the harbour street) on a rehabilitated road of approximately 200 meters.

4.3.2. Power supply

The electrical installations related to the investment will ensure the power supply, the regular and safety lighting installation, the weak current installation, as well as the protection against accidental contact voltage against the power surge of atmospheric origin. The electric power will be ensured by means of the connection to the distribution network existing in the area. In this sense, we insert the site approval notice obtained from ENEL DISTRIBUTIE DOBROGEA.

4.3.3. Water supply

The water supply comes from the public network of Oltenita Municipality, managed by Ecoaqua S.A.

4.3.4. Waste water discharge

Foul discharge

The foul together with the water resulted from cleaning of the areas and that from the cleaning of the vessels in the laboratory will be discharged by means of a R1 connection to the public sewage system of SC ECOAQUA SA CALARASI, OLTENITA BRANCH.

The discharge of rainwater and technological water resulting from the production process

Waste water resulted from the gas stripping and the dehydration of the oil will be passed through a treatment installation before discharging them in the public sewage system.

Once a year, the waste water for the cooling of the installation will also be discharged. Before discharging it in the public sewage system, it will pass through the treatment installation.

Rain water will pass through a hydrocarbons separator and discharged in the public sewage system, by means of a R2 connection.

The composition of sludge generated in Waste Water treatment plant. Preliminary quantity of sludge will be approximately 37-45 kg/hr.

Composition of Sludge

Sr. No.	Item	Biological Sludge (Aerobic)
1.	Total dry solids (TS), %	0.8 - 1
2.	Volatile Solids (% of TS)	59-62
3.	Grease and Fats (% of TS)	
	Ether Extract	5-6
4.	Protein (% of TS)	32-34
5.	Nitrogen (N, % of TS)	2.4 - 2.5
6.	Phosphorous (P_2O_5, % of TS)	2.8 – 2.9
7.	Potash (K_2O, % of TS)	0.5 – 0.6
8.	pH	6.5 - 7
9.	Alkalinity (mg/L as $CaCO_3$)	580 - 590
10.	Organic Acids (mg/L as HAc)	1100 - 1150
11.	Energy Content, kJ TS/kg	19000 - 20000

Note: This is likely to be analysis

4.3.5. Natural gas supply

Natural gas supply will be ensured by means of the connection to the distribution network existing in the area, which is managed by WIROM GAS SA. In this sense, we insert the approval notice obtained from WIROM GAS S.A.:

4.3.6. **Fire extinction systems**

For fire extinguishing, the investment will have its own water intangible supply, or, if applicable, specific extinguishing substances (dry powder, foam). The extinguishing substance supplies will be ensured based on the regulation in force, especially P118-2/2013

5. Duration of the operation stage

5.1. Development period

According to the beneficiary's estimates, the investment implementation duration is 24 months.

5.2. Operating period

The operating duration is at least 49 years according to the concession agreement concluded with Oltenita Town hall, with the possibility to extend it.

6. Information on the physical and biological pollutants that affect the environment, generated by the proposed activity.

6.1. Construction period

6.1.1. Sources of water pollution

- the construction site traffic
- the actual work execution

The supply with drinking water during the construction works will be ensured from external sources: bottled water.

During the construction period:

– the water brought by cistern from the location neighbouring area will be used for land compaction and for reaching the optimum level of humidity

– The concrete that needs technological water is prepared in the nearest concrete plant and are transported to implementation site using proper means.

During the construction works, ecological toilets will be ensured for the entire personnel. These will be discharged by specialised companies or by the company that rents them, based on a contract.

Construction activities– mounting does not generate wastewater or polluted water.

6.1.2. Sources of air pollution

The specific sources of the work site for exploitation and processing are:

Sources at the ground level.

Alternate sources.

Their existence is strictly limited to the functioning period of the work site.

They are not controllable according to Order 462/ 93.

The emission of pollutants is due to the evacuation of gas generated by the functioning of the engines of the work and transport vehicles and the air currents, which engage the suspended particulate matter.

The pollutants to this stage pertain to the construction works, namely: suspended particulate matter and exhaust gas.

The emission factors appreciated according to the AP-42 methodology used within MAPM, which help determining the sedimentation particle and the suspended particle mass flows at a 95% ration, evacuated in the atmosphere following the execution activity are:

Equipment	Emission (kg/h)
Bulldozer	0.75
Excavator	0.75
Front loader	0.75
Self-propelled grader	0.60
Dumper truck	0.60

The suspension dust emissions are the highest emissions during the construction stages. Likewise, the dust emissions increase on hot days and during drought periods.

Diminishing the suspension dust quantities can be done by using certain protective screen (dust screens), which reduce the speed of the wind in the objective's area and by wetting periodically the work surfaces and the connection surfaces within the site's premises.

The calculation of the exhaust mass evacuated, such as the exhaust fumes from the machinery during maximum activity has been performed with a combined methodology AP-42 Corinair - Copert.

The results obtained are as follows:

Pollutant	Emission (g/h)
NOx (such as NO2)	38.5
CO	26.8
COVmm	32.6
Particle	18.4
SOx (such as SO2)	2.83

In order to reduce the exhaust quantity resulting from the compression ignition engines, with which the work and transport machinery are equipped, the proper adjustment must be performed.

For the machines carrying out their activity on site, the periodical inspection and adjustment of the burnt gas supply and evacuation circuits is necessary, in order to comply with the legal provisions regarding the air quality conditions in protected areas.

For dumper trucks, self-propelled trailers and other transport machinery that travel on public roads, the inspection and the adjustment of the exhaust fumes is mandatory and it is imposed by the law regarding public road movement.

If the proper adjustments are made, the emissions coming from the transport vehicles within the work site are higher because of their idle operation, their very reduced travel speed, frequently interrupted by various obstacles, their moving backwards and their ramp movements.

In order to assess the exhaust quantities emitted, specific elements have been considered, such as the type of engine, the existence or non existence of the catalyst,

the type of fuel used, ramp size, parking duration, the idle regime duration and the high-revving idle regime duration.

All these elements contribute to the amount of pollutant level and need a detailed analysis of the real situation.

The pollutant emissions in the atmosphere are subject to the dispersion phenomena, which take place at the same time with the emission ones.

Generally, the air movement in the layer above the earth surface is characterized by the turbulent transport of air masses.

The interaction of an air mass with the earth's surface at a random point leads to the appearance of three components of the movement, which vary in time randomly and continuously.

Fluctuation is the dispersion phenomenon's engine, amplified by the turbulence, which manifests both horizontally and vertically.

Pollutant dispersion in the air in the maximum influence area, as well as the qualitative modifications, which have taken place or which could happen to air quality, have been interpreted by mathematical modelling, using the Gaussian model.

The model uses the following data: pollutant emissions-the pollutant quality evacuated per unit of time, evacuation height, temperature and speed of gas and weather factors - wind speed, atmosphere thermal stratification degree.

Limit Values (VL) and reference values (VR) established by the EU Directives

NOX

VL = 200 μg/ m3 for t < 1h

VR = 135 μg/ m3 for t < 1h

To the concentration values mentioned above, a 98% is added and the following values are obtained:

VL = 40 μg/ m3 for t = 1 year

VR = 30 μg/ m3 for t = 1 year – for the protection of the sensitive ecosystems in unprotected areas.

CO

VL = 100,000 µg/m3 =8 h

SO2

VL = 80 – 120 µg/m3 – the average of the multi-annual daily values measured, associated with the average of the multi-annual daily values measured for the particles materials > 40 µg/m3and < 40 µg/m3 respectively

VR = 100 – 150 µg/m3 for t = 24 hours

VG = 40-60 µg/m3for t = 1 year

VL = 350 µg/m3for 98% for data belonging to the series t < 1h, associated with < 150 µg/m3 for particles

LV = 250 µg/m3-98 value for t < 1h, associated with t < 150 µg/m3 for particles

LV VG = 125 µg/m3for t = 24 h

LV VG = 20 µg/m3for t = 24 h

LV VG = 10 - 15 µg/m3for t = 1 year

Pb

0,5 µg/m3for t = 1 year

All the particulate matter (gravimeter)

LV VL = 80 – 80 µg/m3 – the average of the daily values measured in the morning

LV = 250 µg/m3 – the value of 98 % of the daily value series for t < 1 h

suspension particles with φ < 1o pm

LV = 50 µg/m3 t = 24 h

LV = 40 µg/m3

particulate matter with φ < 2,5 pm

LV VG = 50 µg/m3for t = 30 minutes.

LV = 20 µg/m3for t = 24 h days

WHO recommended values

Cd potentially cancerous element tolerated by the human body below 0.005 μg /m3

Cr cancer risk is 4/10-2 for the entire life related to an exposure to average concentration of μg/m3

Pb 0,5 μg/ m3

Co 60.000 μg/m3 per year related to an exposure of 30 minutes and

10.0 μg/m3 for t = 8 year h

NO2 400 μg/m3 for t < 1 h, 150 μg/m3 for t = 24 h

Values recommended by IUFRO for the protection of vegetation NO2 95 μg/m3 for 4 h exposure,

SO2 150 μg/m3 for an exposure of t < 1 h

Dust pollution

During work execution, the maximum theoretical concentrations for 30 minutes (during prolonged drought periods), could reach the following values for short periods of time and in small areas, without affecting the biological environment:

300 μg/m3 (the value admitted by the CMA NORMA– 500 μg/m3, the value admitted by the E.U. legislation – 250 μg/m3), at the work point.

200 μg/m3 (value admitted by the CMA NORMA – 500 μg/m3, value admitted by the EU legislation – 250 μg /m3), 50 m away from the work point.

55 μg/m3(value admitted by the CMA NORMA – 500 μg /m3, value admitted by the EU legislation – 250 μg/m3), 250 m away from the work point.

Air quality protection prevention measures

The activity dispersion in the operating premises does not allow adopting treatment and collection solutions of gas in the atmosphere, with stationary installations.

Instead, within the objective, technical and organizational measures – will be taken, to reduce as much as possible the atmosphere pollution, by means of a proper maintenance of the machinery, their periodic inspection and by replacing those with serious deficiencies.

All transport machinery and dumper trucks will be equipped with Euro 4 engines, which comply with the international standards regarding the pollutant emissions in the atmosphere during operation.

Ensuring the vehicle engine operation at normal parameters, their rational operation (avoiding speed and load excess) and the compliance with the operation methodology will help keeping the exhaust gas level below the admitted limit.

As for the dust, the emissions generated in the atmosphere, by vehicle movements, after the beginning of the operation, cannot reach high concentrations, harmful to the environment factors.

 Limits imposed by means of the environment legislation in force:

STAS 12574/87 provides the following limit values:

The polluting substance	CMA – short-term average (mg/mc)	Warning Threshold
Suspension dust	0,5	0,35
Carbon oxide	0,6	2,0
Nitrogen dioxide	0,3	0,1
Sulfur dioxide	0,75	0,25
COV	-	-

* According to Order 756/97: - the warning threshold is 70% of the CMA; - the intervention threshold is the CMA exceedance.

 Measures for diminishing the impact during the operation period

Atmosphere pollution is due to the handling and transport of building materials, together with the excavation works for the post foundation; this is why the wetting of the access roads is recommended, during drought periods, for limiting dust emissions.

It is recommended, for the machinery and the transport means, to have their technical inspections performed, while the fuel supply to be done in compliance with the environment factor protection conditions (SOIL and AIR). It is most advisable for the transport machinery to be supplied with fuel at the PECO gas stations.

The atmosphere polluting sources associated with the activities taking place at the studied site are free, open sources, with completely different particularities than the sources related to industrial or similar activities. Therefore, a collection – treatment– evacuation installation for the impure air/residual gas cannot be taken into consideration.

The possibility of the residual gas collection – treatment installations and dust retention is taken into consideration for the concrete preparation installations, which are found in the concrete plants, outside the construction site.

The mounting of collection - treatment (particle retention) is necessary in the cement silos, where bag filters are provided (with vibration – shaking recovery) – 99,9% efficiency.

For the particle emission in the cement concrete preparation installations, the modern technology installation use is recommended, which are generating less pollution.

As for the vehicle emissions, they must comply with the technical conditions provided by the technical inspections that must be performed periodically, during the entire use, to all the vehicles registered in Romania.

In order to limit at maximum the atmosphere pollution in the area adjacent to the operation premises, caused by the operation of the internal combustion engines (the machinery and machines from the gravel pit), Euro 4 engine machinery will be purchased and measures will be taken to diminish the advanced wear of the said engines and their periodical repair.

Noxious gas emission measurements will be performed during the machinery and vehicle operation and the vehicles with major deficiencies will be replaced.

For the winter period, the machinery and transport means fleet will be equipped with electric starters, in order to avoid the evacuation of the

exhaust fumes during long or difficult start-ups. Such installations will be provided at the work points as well.

The machinery and transport means will be inspected periodically from the point of view of the carbon monoxide level and the exhaust fume emission concentrations and will be commissioned only after remedying potential malfunctions.

For the works, the use of machinery and transport means equipped exclusively with Diesel engines that do not generate Pb emissions and generate low carbon oxide emissions is recommended.

The fuel supply of the transport means is done only outside the construction site.

The technological processes generating a lot of dust, such as the earthworks, will be reduced on very windy days, or a more intense wetting of the surfaces will be performed.

The temporary deposits of excavated earth must be limited as much as possible. 2 m high. The construction site roads will be permanently maintained by levelling them and wetting them, in order to reduce dust. For earth transport, tracks located right on the filling body will be provided as much as possible, so that an additional compaction is obtained, on one hand and on the other hand, the dust and exhaust fume emission area is diminished. The transport of the excavated earth must be done with covered transport means.

6.1.3. Sources of soil pollution

We underline the fact that there haven't been other constructions in the past on this site.

Soil and subsoil pollution occurs due to the removal of the soil layer for the construction site.

Various materials are deposited on the soil that affect its quality due to debris and dust remaining after use.

Another pollution source is the leak of oil products, diluent, paint and other technological waste, to which, the domestic waste deposited in an uncontrolled manner may be added.

The protection of the soil is made by recovering the soil and its temporary storage, in order to be used in the process of technological recovery of the exploited area.

Inadequate storage of materials on the specially designated surfaces and recovering the unusable scraps are also ways to protect the quality of the soil.

The leaks of oil products can be avoided by permanently controlling and solving operational defects.

Construction period

During the construction period, the actions generated upon the soil are temporary and imply, mainly, the covering, for a limited period of time, of certain areas for site arrangement, the access roads and the technological platforms. Likewise, there will be definitively covered areas, due to the concreted platforms constructed, the access roads and the machinery technological platforms, which remain active further on, for maintenance purposes.

The impact upon the soil, during the construction period, manifests itself either directly, or by dispersion means.

The forms of impact upon the soil that can be identified during the work construction period are:

- chemical pollution by means of toxic substance content within the dust deposited on the ground;
- qualitative changes of the soil, under the influence of the pollutants present in the air; qualitative changes in the local geochemical circuits.
- soil and subsoil physical degradation on the areas adjacent to the analysed objectives;

  a short reversibility period is estimated following work completion and the restoration of these areas;

- accidental oil product spillage, at the work area level – , which is a remote possibility if the environment protection measures are complied with;
- cave-in, erosion caused by the improper protection of the excavation works performed;
- activation of certain underground pollution sources, by inducing changes upon the groundwater regime in the excavated;
- soil compaction under the effect of traffic and handling of the heavy machinery used for the foundations

The types of pollution mentioned previously can determine the modification of the following soil characteristics:

- soil pH modification;
- soil impurification with heavy metal and hydrocarbon, locally, in the construction site area, where the works are being carried out or in the adjacent areas;
- physical changes affecting the characteristics and properties of the natural soil.

The dust resulting from the earth excavation, loading, transport, unloading processes, for the embankment works, becoming gravitational sediment on the soil, must not be considered pollutant agents. Their association with other polluting substances from the air during that period, in high quantities, may cause problems indeed.

Dust particles

The fine dust, resulting from the construction machinery handling, could fall into this category. The soil areas, on which, a deposit of 100 ÷ 200 g/sq.m./year occurs, may be affected by pH changes and may be subject to structural changes as well.

From the soil pollution point of view, the C.M.A. exceeding in the air, of the suspension particle, raise no concern, as long as they are generated upon the handling of earth volumes.

Other particles, besides the earth ones, generated during the construction period, come from the building materials, among which, the largest amount is that of the cement particles.

Nitrogen and sulfur oxides

These oxides are considered to be the main substances responsible for the formation of the deposits and acid rains. The acid deposits may appear though at variable distances and it is generally difficult to identify the precise source and to quantify their concentrations at soil level.

The effect of such deposits especially that of the acid rains, is the soil acidifying, which entails the decreasing number of soil fauna, the creation of anabiosis conditions towards certain plant species, in other words, the diminished production capacity of the soil.

The temporary occupation of the land will be determined by the requirement to organize the site space arrangements or the production basis (for the offices adjacent to the analysed objectives respectively; a short reversibility period is estimated after the works are completed and the recovery of the site's areas and of those of the warehouses), the access roads for the transport of raw materials.

The contractor is not allowed to work outside the limits given, except for certain exceptional circumstances and upon the environment authority's approval.

At this moment, such a requirement cannot be anticipated.

In conclusion, the activities performed during the designed work implementation period have a direct impact upon the soil, which may be diminished by means of the proper protection and organisational measures

The building activity may represent the soil and subsoil pollution source, by means of the inert waste that might result from it. These consist of the building material debris.

Besides such debris, another source of pollution may be represented by domestic waste resulting from the activity of the personnel working at the objective's implementation.

The periodical disposal of all types of waste is an absolutely necessary measure.

The company shall conclude a service agreement for the disposal of the foul and inert waste from the site.

For the implementation of this project, waste storage installations are necessary, since the waste resulting from the investment performance will be picked up and transported by certified specialized companies.

As for the excavated earth and gravel, resulting from the need to implement the investment, both the earth and gravel will be partially reused for landscape recovery, fillings respectively, while the rest of the earth and gravel will be transported and stored in an inert waste ramp.

All of the objective's equipment must operate within the designed parameters.

Measures to minimize the impact upon the soil

For the soil protection, the diminishing measures are taken already from the design stage, taking into consideration the environment factors as well and optimizing the route of the access roads.

Soil protection measures during the operation period

During the building stage, the impact upon the soil environment factor can be diminished by:

- performing the works rigorously, according to the project, complying with the construction stages, quotas and all the elements provided by the designer;
- carefully handling, according the regulations, of the substances, materials and fuels used for the work performance;

- sealing any fuel storage tank (the fuel supply is recommended to be carried out outside the construction site);
- prohibiting any repair work from being performed upon the operating machinery and vehicles, in uncovered areas or in other areas, where engaging various underground substances resulting in pollutants might take place;
- washing the machinery and vehicles outside the areas intended for this type of activity;
- the immediate removal of the soil layer if its local pollution has been found, eliminating thus the possibility of substances to infiltrate underground and store the soil layer in containers until it is unpolluted;
- creating a site arrangement, proper from the facility and environment protection point of view;
- the provision of chemical toilets for the site personnel and at the work points;
- within the site arrangement premises, the meteoric water drainage must be ensured, since this water washes a large area, on which, various substances might exist from the potential losses, in order to avoid pool formation, which, in time, could infiltrate underground, polluting the soil and the groundwater aquifer;
- avoiding the degradation of the areas neighbouring the construction site and the existing vegetation, from the adjacent perimeters, by means of machinery parking, repairing works performed, material storage etc.;
- collecting all the waste resulted from the building activity and where applicable, their exploitation;
- avoiding fuel losses during construction machinery parking, from the tanks of such machinery or from their connection pipes; in this sense, all construction and transport machinery used will be first carefully examined.

It is also mandatory for the work platforms, for concrete preparation and other equipment necessary during the construction period to be carefully handled, in order to avoid their affecting the soil and the subsoil.

For the construction period, funds are provided and the builder is obliged to take all the environment protection measures for the polluting activities or potentially polluting activities (production bases, material warehouses, site arrangements).

The contracting conditions will also consist of specific measures for site waste management, in order to avoid soil pollution. The following measures pertain to the above mentioned measures:

- The use of any toxic substance in the building process will be performed only after the necessary approvals are obtained, depending on their characteristics, including the storage measures.
- The storage of flammable or explosive substances will be performed in strict compliance with the specific legal standards.
- The handling of the paints and fuels or of other chemical substances will be performed in such a manner as to avoid their leakage and spreading on the ground.

The transport and proper storage of the construction waste will be performed in such a manner as to avoid the en route losses and the storage place must be properly chosen.

The builder is also obliged to ecologically rebuild the occupied or temporary affected land.

In case of accidental spill of polluting substances, immediate intervention measures will be taken by spreading sand, scraping the affected soil layer and its evacuation to the hazardous waste storage facilities.

The monitoring of the construction works will ensure that the environment protection measures necessary are being taken.

6.2. Functioning period

The pollution sources affecting the environment factors will be those that normally exist in any location, respectively:

- waste quantity increase
- the increase of the evacuated foul quantity
- the increase of the emissions in the atmosphere
- the increase of the noise level

We recommend certain organisational measures for the proper maintenance of the soil and subsoil, namely:

Eliminating the worn-out parts resulted from the activity, by exploiting them

Eliminating any type of waste that could affect the quality of the soil;

The proper maintenance of the access roads

By complying with the waste regime, including both the regular disposal and their proper storage, it is considered that the significant negative impact upon the sol and subsoil environment factors will be avoided.

Both during the execution period and the functioning period, the unit will be equipped with a platform for the containers for the temporary and selective storage of the waste–, which will be collected and unloaded at the authorized warehouses by means of a service contract or recycled, as appropriate.

6.3. The main pollutants and their negative effects on environment and health:

For performing the related works and utilities, filling materials, ballast and actual building materials will be used.

A special group is represented by the fuel and lubricants for machinery and transport means, which will be ensured, with no connection to the work concerned, by the holders of the mechanized means.

The risk degree for the environment, as a measure of the pollution degree, may be defined as the effect upon the humans, animals, plants and materials produced by adding certain chemical products to the regular elements of the ecosystem.

It is considered to be a substance with polluting effect the substance that creates a measurable effect upon the subjects of the ecosystem and the maximum concentration admissible is the limit from which the presence of such substance would create irreversible effects in the food chain.

The pollution influence upon humans may manifest itself more or less favourable by means of toxic effects, which depend on:

- the type and characteristics of the polluting substances (toxicity, concentration,

exposure time etc.)

- the components of the biota and their characteristics:
  - the composing species;
  - age, sex, health condition;
  - individual particularities that provide a better or lower resistance of the subjects;
- the conditions under which the pollution occurs:
  - climate factors: temperature, atmosphere temperature;
  - eating condition.

Toxicity may manifest itself by means of acute effects, which are caused shortly after the contact (ingestion, inhalation) with the polluting substance, or by means of chronic effects, which appear after a longer exposure period.

The mechanism through which the toxic substances act may be:

- local action, when the effect is exercised in the spot where it has entered the body;
- general action, when the action is exercised after the toxic substance has entered blood flow;
- direct action, the effects are exercised by means of certain modifications caused after the toxic substance has entered the body;
- temporary/permanent and irreversible/reversible action.

Suspension dust

The most frequently used definition in the hygiene-sanitary field delimits the dust "the solid particles capable of staying for a certain period of time suspended in the atmosphere of the work places".

The main entry pathway of dust in the digestive tract is the respiratory tract. Even if a relatively large dust quantity enters the digestive tract through swallowing, the consequences are insignificant when such dust is non-toxic.

As for the dust retention in the various area of the respiratory tract, it has been established that particles larger than 10µm are retained in the nose. The efficiency of their retention in the nose becomes null for 1µm sizes. In the pulmonary alveolus, the retention of the particles is greater, being approximately 100% for the particles smaller than 2µm and it decreases below such size, reaching a minimum for the 0,5µm particles, after which, it features an increase again. It has also been found that the percentage of dust particle entry in the pulmonary spaces increases from 0 for the 10µm size, to a maximum for the 1µm size and smaller.

The non-toxic solid particles with a 20 µm diameter belong to this pollutant category. Among these, the particles having micron and sub-micron diameters reach the lung through the respiratory tract, where they deposit. When the quantity inhaled in a certain period of time exceeds the quantity that can be eliminated naturally, lung dysfunctions appear, starting with the diminishing of the breathing capacity and of the blood gas exchange area. Such phenomena favour the onset or chronic course of the cardio-respiratory disorders.

If the particles contain toxic substances, such as heavy metals for instance, when talking about coal ash, such particles become very aggressive, the release, in the plasma and blood of the metal ions leading to very serious disorders, depending on the metal and quantity.

The severity of the disorders caused by the dust at eye level depends on the size and shape of the particles, as well as on their chemical structure. The first symptom

is, usually, tearing, which occurs as a reflex, caused by the conjunctiva and cornea irritation, lasting only as long as the person is working in the dusty environment, but it may last afterwards as well.

Another symptom caused by the dust is the blefaroconiosis, which may lead to alterations of the eyelids, with deformation, adherent and deviation of the eyelashes, which irritate the cornea. The disorders caused by the dust at nose level are called rhinoconiosis. At this level, the dust can cause catharral rhinitis, rhino lithiasis, septum ulceration. At ear level, irritation of the auricle and auditory meatus skin may occur, as well as ear wax plugs in the outer ear, which form from the mixture of dust and sebum. At skin level, the dust deposits on the uncovered parts, on the wrinkled joints, at the bottom of the locks of hair causing disorders especially in the areas subject to irritation, such as the neck, the armpits and the belt. The dust action upon the skin may be mechanic, caustic, sensitized and carcinogenic.

The maximum concentration of the dust at the work places, according to Order no. 1957/1995, depends on their type

- total dust: 10 mg/mc;
- breathable dust: 10 mg/mc;

The exposure to acid aerosols leads to the increase of morbidity caused by lung disease such as: allergic asthmatic bronchitis and chronic bronchitis.

The presence of the nitrogen and sulfur oxides under favourable weather conditions may lead to acid rains. Such rains may affect both the vegetable crops and the quality of the constructions in the area, as well as the health of the population

Effects upon water and soil

The contribution of atmosphere pollution to the water physical and chemical parameter takes place by its dry and wet deposits and it is felt, mainly, in the standing surface waters (lakes, accumulations for locality water supply).

At the air-water contact surface, the acid gas transformation occurs (SO_2 and NO_2) into powerful acids that lead to increased acidity (pH decrease) of the water and to its loading with sulfates and nitrates. The pH decrease leads to the acceleration

of the heavy metal compound dissociation, to the release and increase of their ion mobility. The dust contributes to the increase of the water opacity and if it contains toxic compounds, it contributes to the loading of the water with such compounds.

The toxic action of all these elements affects the aquatic flora and fauna, the spontaneous and cultivated flora and the humans as well, who swallow the contaminated water and food. By wet deposits (precipitations), the pollutants present in thick layers spread by air are deposited on the water surface, bringing their contribution to the pH change, the change of the water conductivity and its loading with sulfates, nitrates, chlorides, metals.

The organic compound loading leads to the surface water eutrophication, determining the biotope's modification (presented above).

CO

CO is a colourless and odourless gas, formed when the carbon in the gasoline is not completely burnt. It contributes more than a half to the national level of pollutant emissions.

High levels of CO are found in the areas with high vehicle traffic, 95% of the overall CO emissions resulting from the exhaust fume evacuation.

Other important CO sources come from the industry and forest fires. The highest values are found in the cold months of the year, when the thermal inversion takes place (the air pollutants are found at ground level, due to the warm air layer).

Once the CO reaches the lungs, it passes into the blood, thus reducing the oxygenation level in the tissues and organs. This is why the person who suffer the most from the carbon monoxide exposure are those persons having cardiovascular disease (angina pectoris). At high levels, it is lethal and even healthy individuals may be affected.

Pollution effects: the decrease of visual acuity, the diminishing of work and learning capacity, the diminishing of the motor skills.

CO2

CO2, together with the temperature, the light, the oxygen, the mineral salts, represent one of the basic factors (essential) that conditions and determines primary production.

The increase of CO2 emissions into the atmosphere leads to the expansion of the "greenhouse effect", leads to increased temperature, which also reflects in the modification of the values registered by the primary productivity of the different types of ecosystems, including the aquatic ones.

The increase of the CO2 concentration in the Earth's atmosphere is a factor that could influence the photosynthesis processes, although an increase of the CO2 concentration in the environment does not automatically lead to an immediate increase of the photosynthesis.

CO2 is much more concentrated in the water than in the air, since water can store a higher quantity. The sea water is slightly alkaline (ph-8-8,3) and it contains certain cations (calcium, magnesium), which exceed the quantity of the equivalent anions, allowing the CO2 to combine with sea water, forming carbonate and bicarbonate.

$CO_2 + H_2O \rightarrow H_2CO_3$

$2H^+ + CO_3^{-2} \rightarrow HCO_3^- + H^+$

CO2 has an intense circuit, in the sea and ocean waters.

CO2 increases its concentration on the bottom of the basins; in the minimum oxygen area, the CO2 concentration is higher. In deep sea, the bicarbonates accumulate and the calcium carbonates are missing, which makes it difficult for the organisms in the abysmal areas to accumulate calcium and that is why such organisms have a skeleton of cartilage, with a low quantity of calcium.

In the absence of the light, CO2 is not used by the plants. When a small quantity of light is available, a certain quantity of the CO2 reserve will be used; an increase of the CO2 quantity in the environment will not automatically lead to the proportionally increased photosynthesis, except within certain limits.

CO2 plays an extremely important role, being one of the elements on which the primary production organic synthesis is based.

The chlorophyll assimilation of the CO2 is the way by means of which the mineral carbon enters the organic carbon world.

From the 5mg/l CO2 concentration, we can talk about the aquatic environment saturation as compared to the photosynthesis requirements. The assimilation of CO2 available in excess by the plants leads, actually, to the bicarbonates decomposition and sometimes to the deposit of certain insoluble carbonate quantities (when the alkaline reserve is made of calcium salts).

The experimental research upon the algae targeted cultivation have shown that the bubbling of the algae suspensions with an air and CO2 mixture (at a 1:5% ration) leads to the significant increase of the crop yield, materialized in the increase of biomass production.

If the CO_2 is taken from the water, then the bicarbonates and the carbonates will become a CO2 source.

CO_2 is a regular product of all the combustion processes and it is not dangerous for the organisms, except for very high concentrations, when it is inhaled in large quantities and it causes suffocation and then asphyxia. The emission of carbon dioxide quantities in the air in the last 150 years (the industrial era) has led to their accumulation in the atmosphere and to the appearance of the "greenhouse" phenomenon, with repercussions upon the world climate and implicitly, upon the biosphere.

NOx

The main nitrogen oxide sources in nature are:

- natural sources, represented by the biological processes, especially the bacterial ones, which release important oxide quantities;
- technological sources, represented mainly by the fuel combustion, chemical processes;

The quantities of nitrogen oxides eliminated in the environment depend on the number of existing technological sources, weather condition etc.

The nitrogen oxides absorb and diffuse light. These oxides are subject, in the air, to a complex series of reactions with photo-chemical oxidizing substances, macro-particles and sun light forming a smoke and mist mixture.

The short-term exposures lead to changes in the respiratory function, not only in the regular subjects, but also in those suffering from bronchitis.

Besides the known effects of eye and respiratory tract irritation, the nitrogen oxides bleach out the tissues and destroy the synthetic fibres. The high concentrations of nitrogen oxides in the inhabited areas have caused frequent cases of respiratory tract disease. These oxides are irritants of the mucous membranes and especially of the respiratory tract mucous membrane, at which level, they can cause an acute edema. The oxides produce methemoglobin. Inhaled for a long period of time, NO_2 causes headaches, insomnia, nose and mouth ulcer, anorexia, dental erosion, weakness, chronic bronchitis, emphysema.

The gas pollutants emitted in the atmosphere can react, generating new products. As for the nitrogen oxides, the absorption of the UV light leads to the breaking of certain bounds, forming atomic oxygen Nitrogen dioxide. The reaction of these products with the molecular oxygen leads to the formation of the ozone and of the nitrogen peroxide.

The poor concentration of nitrogen peroxide may generate relatively important quantities of atomic oxygen, which leads, in its turn, to the formation of the ozone that can react with the organic pollutants.

Mixed with the ozone, it has synergistic effects, which also happens in the presence of the suspension dust. Long term exposures lead to effects on the lungs, spleen, liver and blood. The effects upon the lungs may be reversible and irreversible. The appearance of emphysema, lung cell alteration, the increase of the lung bacteriological infection susceptibility has been noticed.

The effects upon the lungs

The exposure of the plants to NO concentrations$_2$, which exceed 25 ppm, for a longer period of time, causes acute necrotic lesions in the leaves. These lesions are characteristic to each plant, but are not specific and the actions of other chemical substances cannot be determined.

A threshold concentration, which produces visible lesions in plants, is 10 – 15 ppm, for one hour. If the exposure time is prolonged to 8 – 21 hours, the same lesions are obtained with 2,3 – 3,5 ppm NO_2 and at an exposure of 28 hours with 1ppm.

The effects of vegetation exposure to low NO_2 concentrations for a long period of time, are less obvious. Recent studies have shown that at 0.25ppm NO_2 concentrations and smaller, which have acted for 8 months, am accentuated leave fall has been caused.

The mechanism by means of which the nitrogen oxides cause lesions in plants is not clarified. The fact that there are important variations of the plant sensitivity to NO_2, could indicate the pollutant's reaction with a plant's metabolite, which could accumulate only during certain periods of the day. The absence of the plant's protective metabolite in certain periods could cause this sensitivity.

The effects upon the goods

Corrosion effects in the presence of the nitrogen oxides at 0,066...0,084ppm concentrations have been noticed.

In Romania, depending on the type of pollutant concentrations, as well as the air humidity, aggressiveness classes have been established for the purpose of providing the proper protection. Thus, for the NO_x emission concentrations the following aggressiveness classes have been established:

A) 0,05 mg/mc

B) 0,05 – 1 mg/mc

C) 1 – 1,1 mg/mc

The nitrogen oxides cause an blending of the colouring agent shade fixed on the textile fabrics and a yellow tendency of certain additives of the textiles. Certain synthetic fibres react directly with the nitrogen oxides, producing a yellow colour.

The nitrogen dioxide may form explosive mixtures with organic substances. It may cause fires if it contacts clothes and other combustible materials.

The maximum concentrations admitted of the nitrogen oxides at the work places, according to Order 1957/1995, are:

- 5mg No_x/mc average concentration;
- 8mg No_x/mc highest concentration

SO_2

The sulfur dioxide, SO_2, is one of the main pollutants of the atmosphere. The SO level$_2$ in the atmosphere, together with the particle content (dust, smoke, soot) is one of the most important indicators of air pollution.

SO_2, like other sulfur oxides, emitted as pollutants, comes, most of all, from the burning of the gas, solid or liquid fuels, which contain sulfur in more or less high concentrations (1 – 10%). By burning these fuels, important SO quantities are released$_2$ and a smaller quantity of sulfur trioxide.

SO_2 is a colourless gas, non-inflammable and non-explosive, soluble in water. At concentrations higher than 860µg/ m3/h. it may be considered organoleptic, non-inflammable and when 8000 µg/ m^3/h. ^{it} features a strong odour, being irritant to more than one person.

In the atmosphere, under certain conditions, in the presence of solar energy and of certain catalyst metal compounds, SO_2 is oxidized at SO_3, a gas, an extremely irritating gas. Part of the SO_2 and SO_3, in the presence of water vapours turns into sulfurous acid and sulfuric acid.

The presence, in the air, of the sulfur dioxide contributes to the mist formation, to the reduced visibility and to the cloud formation.

Toxicological considerations

The main toxic action of the sulfur dioxide is that of irritant, especially when it comes to the higher respiratory tract.

In case of high concentrations, the sulfur dioxide affects directly the respiratory tract. The harmful action of the sulfur dioxide upon the haematopoietic organs is also known (bone marrow, spleen). The toxic favours the formation of the methemoglobin and unbalances the carbohydrate metabolism. Inhaled in small and repeated concentrations, it exercises an irritating action upon the mucous membranes, and in large quantities causes hoarseness and chest constriction sensation and bronchitis. In case of prolonged time spent in a vitiated environment, simple or bleeding vomiting appears. High concentrations cause acute bronchitis, dyspnoea, fainting tendency. Besides the mentioned symptoms, it causes eye irritation accompanies by tearing and stinging.

The sulfur dioxide is easily transported at high distances. Even to hundreds of km, mainly due to its fixing on dust particles, smoke or aerosol, easily carried by the wind. In combination with water vapours in the atmosphere, it forms sulfuric acid, which, in its turn, contributes decisively to the formation of acid rains.

The entry pathway to the body is the respiratory tract.

The effects, on both short term exposure (10-30 minutes) and on average term exposure (24 hours) and long term exposure (year) are connected to the alteration of the respiratory function.

At concentrations exceeding 1000 µg/ $m^3$for 10 minutes, serious effects might appear, such as: broncho-constriction, bronchitis and chemical tracheitis. At concentrations of 2600-2700 µg/ m3/h. for 10 minutes, the risk of bronchial spasm in asthmatic people might appear.

It is important to mention the fact that there is a great variability of SO sensitivity 2 in the human subjects. The short term repeated exposure to high concentrations, combined with the long term exposure to smaller concentrations, increases the risk of chronic bronchitis, especially in smokers.

The long term exposure to small concentrations leads to certain effects, especially in sensitive subjects (asthmatic persons, children, elderly people). The sulfur dioxide and the suspension particles have a synergistic effect, the association of these pollutants (present simultaneously in the combustion gases) leads to the mortality, morbidity increase, by means of cardio-respiratory disorders and the deficiency of the pulmonary functions. In children living in industrialized areas, the decrease of the vital capacity has been noticed. The synergistic effect appears both on short term exposure and on long term exposure.

The effects upon vegetation

The presence of SO_2 in the air causes, generally, vegetation damage. Many plants are more sensitive than humans and animals, both to lower concentrations on long term and to increased concentration on short term, SO_2 might damage the plant's tissue, bleach out its leaves, stop a plant from growing and it might reduce crops. The sulfuric acid mist also damages vegetation. The sulfur compounds attack the plants and the vegetables such as spinach, oat, rye, chicory, sugar-beet, cotton, celery, tobacco, citrus fruits, apple trees, pear trees, pine trees and a large variety of flowers.

According to certain specialists, the vegetation is seriously attacked when the annual average of the sulfur oxides exceeds 0,03ppm.

SO2 might cause ecological balance modification in the Black Sea seaside area, because of the significant diminishing of the development and diversity of macrophyte algae, which usually occupy the banks of the pools, of the lakes and of certain canals in the Danube Delta.

The presence, in the air, of the sulfur dioxide contributes to the mist and cloud formation, consequently reducing the visibility.

The maximum concentrations admitted of the sulfur oxides at the work places, according to Order 1957/1995, are:

- 5mg So_x/mc average concentration;
- 10mg Sox/mc high air concentration

Zinc

The zinc is free in the air, water or soil, but its concentrations increase from one year to another, because of the human activity intensification, which generates such a metal: industry, mining, coal burning and steel processing.

The waters are zinc polluted, because of the presence of a large quantity of this metal in the waste waters evacuated from the industry. This water is not properly treated. A consequence of this fact is the deposit of the zinc of the river banks. The zinc may also increase water acidity.

The fish may swallow zinc, when they live in the contaminated environment and further on, the metal may be transmitted to the current food of humans.

High quantities of zinc can be found in the soil. When the agricultural soil is polluted with zinc, the animals will also suffer because of it, since various disease specific to zinc intoxication appear. The zinc soluble in the soil water may contaminate the groundwater as well.

The zinc is also a threat for the plant species. They cannot absorb the entire quantity found in the contaminated soil.

Finally, the zinc influences negatively the activity of the microorganisms and the rain worms in the soil. The biochemical decomposition might suffer because of it.

The zinc is an essential element for people's health. When the zinc level in our body is low, a lack of appetite appears, along with the sense diminishing (taste and smell) and with the diminished capacity of wound healing and skin inflammation.

Although humans can retain high concentrations of zinc, a too high quantity can cause health problems: stomach cramps, skin irritation, vomiting feeling, dizziness and anaemia. Likewise, the high zinc quantities in our body might affect the pancreas and the metabolism. The long term exposure to zinc chloride might cause respiratory dysfunctions.

At the work places exposed to zinc contamination, occupational disease might appear (''metal fever''). The disease passes after two days and it is caused by the over exposure.

The zinc might be dangerous for the fetus or for the new-born babies and it is transmitted by the mother through the blood or the milk.

Cadmium

Naturally, a very high quantity of cadmium is released in the atmosphere (25.000 tons/year), half of it being caused by the forest fires and volcano activity. The remaining quantity is generated by human activities (industry).

The air emission are generated by fuel combustion. Currently, because of the numerous regulations regarding pollution, the quantities of cadmium released in the environment are getting smaller.

Part of this metal infiltrates in the soil after the fertilizer is applied on the farmlands, while the other part reaches the streams due to it being washed by the rain water.

It is absorbed by the organic matter in the soil and becomes extremely dangerous because it is absorbed by the plants used in the current food. The acid soils increase its accumulation by the plants. The herbivorous animals eating these plants will suffer from cadmium intoxication and the effects upon their health will be similar to those of humans.

The earth worms and the other organisms in the soil are extremely vulnerable to the intoxication with this metal. They can die even when the concentrations are extremely low and this fact affects the soil in general. When the concentrations are very high, the entire soil ecosystem will suffer.

The living creatures that get in contact with cadmium contaminated food or water will suffer from the following:

- high blood pressure
- liver disease
- nerve or brain damage

Negative effects upon people's health.

When a Cadmium intoxication occurs, the first to be affected is the liver. The liver transforms it into proteins that form certain compounds transported to the kidneys. It accumulates in the kidneys and destroys the filtering mechanisms. A very long period of time is necessary for the accumulated metal in people's body to be eliminated.

Other negative effects of Cadmium upon health:

- stomach ache, vomiting sensations
- bone fractures
- infertility
- central nervous system lesions
- immune system destruction
- psychic problems
- it might cause cancer and possibly destroy the DNA

6.4. Measures for the correct material management

For an efficient control of the material volume, the following measures must be taken:

- quality ensuring measures, which will consist of quality certificates and documents, while for the land, site determinations are necessary
- measures for guaranteeing the necessary quantities, consisting of transport, documents, sample or overall delivery weighing or measurements
- specific measures for avoiding degradation by proper covering or storage
- measures for ensuring a correct and intensive mechanization of handling practically using only specific machinery: self-loading machinery, forklift, cranes etc.
- measures for work protection in all transfer, loading, unloading operations that are performed based on specific instructions and protection equipment, using, at the same tie, less workmanship possible
- measures for the constant maintenance and washing of the zonal roads and site paths, by levelling them with motor graders, ballast filling, wetting
- measures for avoiding dust pollution and powders by using airtight transport means

7. Other types of physical or biological pollution

The noise is an omnipresent environment factor, for which, the limit between the necessary level and the harmful one, depending on many factors (physical factors of the noise, personal factors of the recipient or other external variables) is difficult to establish.

The occupational exposure, at considerable high levels of noise, for a relatively short period of time is responsible for the ear effects, auditory acuity limitation, as well as for the action, as a risk factor associated with the appearance of serious blood pressure, to the heart attack risk increase a.s.o.

The prolonged exposure to a high level of noise causes acute and chronic disorders, which lead to modifications at the level of the entire human body.

The impact on the body manifests itself by means of:

– heart rate acceleration, blood pressure increase, respiratory frequency and amplitude increase etc.

- the impact upon the cerebral cortex, which reacts simultaneously or independently by decreasing concentration, insomnia, quick fatigue, which all lead to the diminishing of intellectual work, headache, nervous asthenia etc.
- among the disease caused by noise, we also mention: neurosis, psychasthenia, gastric and duodenal ulcer, colitis, diabetes, hyperthyroidism etc.

In case of population exposure, characterized by reduced, but persistent levels, the main effects are the non-specific ones, due to the action of neurotrope stress agent of the noise. It manifests from the psychic point of view, from simply diminishing the attention capacity and the mnemonic and intellectual capacity, and until it reaches psychic and behavioural disorders and are clinically translated through fatigue, irritability and discomfort sensation.

Noise exposure may cause various types of reflex response, especially if the noise is unexpected or unknown. These reflexes are mediated by the vegetative nervous system and are known under the name of stress reactions. They express a defence reaction of the body and are reversible when talking about short term noise. The systematic or persistent repeating of the noise cause definitive alterations of the neuro-vegetative system, blood flow disorders, endocrine, sensory, digestive disorders etc.

The effects on the body caused by the chronic exposure to noise, listed in the specialty bibliography, are presented in the following table:

Critical exposure level and effects:

Equivalent noise level/dB(A)	Effects
20 ÷ 45	Reduces the speaking intelligibility
35/internal	It affects sleep quality
42/external	Discomfort
55/internal	Awakenings
70/external	Heart disease

75/internal	Hearing impairment
70/external	High blood pressure

8. The main alternatives and the motivation for choosing one of them

"Zero" alternative or "no action"

The „zero” alternative was taken into consideration as a reference element for the comparison with the other alternatives for the different elements of the Project.

The main forms of impact associated with the „zero” alternative are:

- losing important job opportunities;
- losing the investments made until the present moment, having as a result the loss of interest from private investors, commercial banks and international financing institutions regarding the future industrial development projects in the region and in Romania;
- losing the support for the development of a modern installation, according to the regulations, which is in the field of the reducing waste quantities at national level - recycling the waste oil);

The most favourable situation for the area would be:

- to have solid economic opportunities and jobs;
- the impact on the environment and the social one generated by the activity that is to be developed and the other major economic developments has to be at a minimum level;
- to have the technical capacities and resources necessary to remedy the occurrence of pollution.

In order to achieve all these (and preventing the negative social and economic impact generated by the lack of project implementation) a viable economic resource is necessary,

which must be capable of generating a significant number of job opportunities and enough income to allow the environment issue solving.

Below, you can find a comparison of the impact forms on the environment corresponding to „zero" alternative with the ones of the implementation of the project.

Alternatives:

The proposed option leads to the following advantages:

new jobs will be created;

the extension of the city water distribution network

creating a sewage system to direct the wastewater towards the treatment plant

the power supply network will be developed in order to ensure a high reliability degree and a good quality exploitation;

applying a modern and efficient system in waste management;

introducing new source sorting systems and selective collection of recyclable materials.

Regarding the present situation, the following have been taken into consideration:

Economic criteria (efficiency respectively). The proposed solution has the best results from the cost point of view, which is smaller in comparison with other options; similarly, the maintenance costs are reduced.

Social criteria (social acceptability respectively). The proposals have the best results from the human factor protection point of view; the positive impact on the inhabitants is significant.

Environment criteria (the environment sustainability respectively) The proposals have insignificant effects on biodiversity, which has been developed in the Study for the Adequate Assessment, approved by APM Calarasi. It is true that, at first sight, it is an act of courage to build a waste oil recycling plant in the neighbouring area of

the Nature 200, but the environmental monitoring has shown that there are no priority habitats in the area, so no habitats are destroyed, the identified bird species are not resident on the site, they have been observed only in transit and most of the technological processes have a closed circuit. The investment also brings benefits to the environment by creating a facility that will reduce the amount of waste oil used nationwide. A strict monitoring program will ensure the fact that there will be no significant or negative effects on the environment.

The work proposals comply with the technical regulations on force. A different design option would not have had additional environment benefits compared to the option chosen.

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 builder's technology. The technical solutions that will be further proposed will have to take into consideration:

- environment conditions,
- type and nature of works
- the possibility to use local materials,
- technical and functional utility and the security of the proposed development,
- facilities, functional, geological, hydro-geological, hydrological and institutional characteristics of the area,
- the existing neighbouring areas.

The tender books will contain a recommendation for the builder to use modern equipment that complies with the technical prescriptions, as well as with the European regulations in force in the field of the environment protection. There is also the recommendation that where the work spaces are limited, manual work should be used mainly, to reduce as much as possible the impact of the execution works.

9. The geographical and administrative location of the sites for the project's alternatives

For the project proposed, the current location is the only location on which the proposed project can be implemented.

10. Information on the current use of the land, the existing infrastructure

On the day this documentation is prepared, the site is vacant from any construction.

The studied land is located in the build-up area of Oltenita town, and has changed its intended purpose to industrial area, following the Zonal Urban Plan approved in 2017.

The studied area will have a single Reference Territorial Unit (R.T.U.1) - industrial area (industrial construction and activities).

The area regulated from the urban planning point of view has 17,88 ha and on this area, the objective's premises are to be located.

The current use category is that of non-productive land. The land that is the object of this investment is an arable land.

10.1. Information on the natural, historical, cultural and archaeological values

The natural values

The studied location, according to Order no. 776/2007 is near the European ecologic network Nature 2000, 7 m away from the site RO SPA 0038 – Danube - Oltenita, site of community importance.

The historical, cultural and archaeological values

Close to the land, there is an archaeological site, 24 meters away, dedicated to the Gumelnita culture. The beneficiary has received the Notice of approval from the Oltenita Museum.

10.2. Information on protected natural areas, sanitary protection zones

The site ROSPA0038 Danube-Oltenita is positioned on the Danube between km 451 and km 430, is situated in the south part or Romania, in the flood plain of the Danube.

It includes both the area spreading from the Danube to the Greaca, Cascioarele and Oltenita localities and the agricultural lands belonging to the Greaca-Arges-Chirnogi embanked premises. The geographical coordinates are 26º 29’ 4” east longitude and 44º 3’ 48” north latitude. It spreads on a 6022 hectare area. The average altitude of the territory is 15 m. Most of it belongs to Calarasi County, only 5% belongs to Giurgiu County.

In the eastern part of the site, the Oltenita town is located, on the bank of river Arges, which is included in the site.

The north part of the site can be accessed passing through Chirnogi, a locality situated on DN41 - Oltenita - Giurgiu -, and then following local roads towards the Danube's bank. The site is also accessible by the Danube's bank, upstream from Oltenita. From administrative point of view, the site is located in the localities Prundu - Giurgiu County, Chirnogi, Oltenita Town - Calarasi County.

The purpose of designating the ROSPA0038 Danube-Oltenita site is that of preserving the wild bird species existing on its premises, maintaining/restoring the favourable preservation statute of the community interest bird species and their specific habitats.

The Bird Special Protection Area ROSPA0038 Danube-Oltenita - hereinafter referred to as the ROSPA0038 Danube-Oltenita Site - is a protected natural area protected

of community interest - the special protection area category according to Directive 2009/147/CE of the European Parliament and of the 2009 Council regarding the preservation of wild birds, designated by means of the Government's Decision No.1284/2007, the designation of the bird special protection as integral part of the European ecological network Natura 2000 in Romania, amended and supplemented by means of the Government's Decision No. 971/2011.

The Site ROSPA0038 Danube - Oltenita falls under the 4th management category, areas for the management of the species and habitats.

The Site ROSPA0038 Danube-Oltenita partially overlaps with the community interest protection site ROSCI0088 Gura Vedei-Saica-Slobozia.

Close to the ROSPA0038 Danube-Oltenita Site, there are the following special bird protection: Oltenita-Ulmeni ROSPA0136, Comana ROSPA0022, Ostrovu Lung - Gostinu ROSPA0090, Vedea Dunare ROSPA0108, Oltenita – Mostistea- Chiciu ROSCI0131.

The ROSPA0038 Danube-Oltenita Site is part of the continental bioregion. The ROSPA0038 Danube-Oltenita Site consists of the following ecosystem categories:

a) Agricultural ecosystems
b) Water ecosystems
c) Meadow ecosystems
d) Forest ecosystems

All these ecosystem categories have their own role within the Natura 2000 Site, providing food, shelter and/or nesting for the bird species.

On the location, there are no habitats of community interest. The characteristic habitat is the agricultural, man-made land.

There weren't any protected species or nests found in the development area of the future project. The species observed in the perimeter were observed during the feeding time or in transit.

As a conclusion, the area is of no interest for the bird species for which the site has been designated, they do not use it in the nesting period or in other seasons, being a predominantly degraded area.

The habitats present in the studied site fall under the standard form Nature 2000, in stage – C of average or reduced conservation

Taking into consideration the conservation degree of the structures and the functions of the habitat type, as well as the recovery possibilities, we can say that in the studied area, the site has a partially degraded structure.

From the point of view of the Nature 2000 Site, the proposed project is not located on the said site's perimeter and there haven't been identified any species of birds that lay eggs in this location. Most of the protected species that were observed while monitoring the area were species that were only in transit. The number of the bird population is small due to the unfriendly conditions of the territory, which is strongly anthropized.

In the operating period, the impact on the environment will be insignificant as the unit will be a closed circuit one and no wastewater will be discharged into the natural environment nor emissions to the atmosphere, which are taken over by the exhaust systems equipped with performance filters.

The impact of the operating stage on the integrity of the site Nature 2000 is insignificant due to the fact that there isn't a loss of the habitats of interest, there is no fragmentation of the habitats, there is no loss of surfaces of the habitats used for food, rest and reproduction of the species of community interest.

The impact of the operating stage on the conservation of the species of community interest, for which the Nature 2000 site was designated, is insignificant.
The combined impact on the conservation of the species of community interest in the Nature 2000 site is insignificant.

The impact of pollutant emissions on the environment and especially on species of community interest is reduced due to the use of high-end technology, by installing advanced filters, by re-circulating the technological water, by installing wastewater pre-treatment facilities.

Likewise, the monitoring of the bird species during the entire development of the project and after its completion will continue, to see if there are changes in the dynamic of the populations and their numerical evolution.

11. Information on the existing documents/regulations regarding the land planning/development in the area of the project's location

The land proposed for the investment is located in the built-up area of Oltenita town, being regulated by the town planning documentation – General Urban Plan stage– prepared and approved in 2017 and by the Zonal Urban Plan of 2017.

The studied land is located in the southern part of Oltenita Municipality, adjacent to two water courses – the Danube and the Arges rivers.

The company's regulatory acts are:

1. Town Planning Certificate
2. Registration Certificate
3. Confirmation of Company Details
4. Zonal Urban Planning approval Decision
5. Development Site Plan
6. Concession Agreement
7. Environmental Permit
8. "Apele Romane" Certificate (Romanian National Water Administration)
9. Bio Romania Custodian Permit

12. Information on the methods proposed for the connection to the existing infrastructure

12.1. Water supply

The water supply will come from the public network of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA by means of connecting pipes.

The water from the public system will be used:

- for hygienic purposes by the company's employees
- technologically (steam preparation, cooling of the installation (water is recirculated)
- in the laboratory (the vessels will be washed)
- cleaning the areas
- to ensure the fire fighting and safety procedures– , a fire tank is provided, to fuel the hydrants, if needed.

The plant will use part of the technological processes, mainly demineralised water. The necessary steam quantity is very small, mainly for the cleaning of the equipment, at shutdowns. The void pumps do not need steam, like the conventional ejectors, using thus the best technology in this field.

The cooling needs will be ensured by a system of re-circulated water cooled in a cooling tower. Thus, possible leaks of oil products will not affect the groundwater, being a closed circuit.

12.2. Waste water discharge

On site, the following categories of wastewater will result:

- foul
- from cleaning the areas
- from the laboratory (washing the recipients)
- from the gas stripping
- from the dehydration of the oil

The water that will be used in the plant, will pass through a softening/ demineralisation installation before use.

Wastewater together with the water resulted from the cleaning of the areas and from washing the recipients (in the laboratory) will be disposed by means of a

R1 connection to the public sewage network of SC ECOAQUA SA CALARASI OLTENITA BRANCH

Waste water resulted from gas stripping and oil dehydration will be passed through a treatment installation before evacuating them in the public sewage system.

Once a year, the waste water for the cooling of the installation will also be evacuated. Before evacuating it in the public sewage system, it will pass through the treatment installation.

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

Rain water will pass through a hydrocarbons separator and evacuated in the public sewage system, by means of the R2 connection.

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

The site is located in an embanked area, 16.5 m average height from water level.

Due to the fact that the site is located in the flood plain area, a hydrological study has been conducted, to determine the maximum level of the water, flow-wise, with an exceeding probability of p=1%.

Based on the measurements performed, the following conclusions have been reached:

- the results of the hydraulic calculation prove that the premises of the future objective is not endangered by the flash floods of the Arges river, featuring exceeding probability flows p = 1% (the embankment of the left river bank is reported to have a Hmax1% Arges ranging between 1,38 m ÷ 1,83 m in the area of the future objective location).
- Intersecting the numerical modelling of the land with the plan determined by the water level corresponding to the flow with an exceeding probability of p = 1% on the Danube river (Q1% = 1600 mc/s) namely: Hmax1%Danube = 18,12 mdMN75 – it results that the entire premises of the future objective is flood plain.
- Since most of the land quotas within the future objective are ranging between 16,50 ÷ 17,00 mdMN75 – it results that if a flash flood with the probability

of p = 1% on the Danube river, the land concerned is located under a water column ranging between: 1.2 ÷ 1.62 m

The solution for defending the premises of the future objective in case of flash floods on the Danube river with an exceeding probability of p = 1% consists of a platform for lifting the installation location above the flooding quota.

12.3. Power and heat supply

Electrical installations

The electrical installations related to the investment will ensure the power supply, the regular and safety lighting installation, the weak current installation, as well as the protection against accidental contact voltage against the power surge of atmospheric origin. The electric power will be ensured by means of the connection to the distribution network existing in the area. In this sense, we insert the site approval notice obtained from ENEL DISTRIBUTIE DOBROGEA.

Natural gas supply

Natural gas supply will be ensured by means of the connection to the distribution network existing in the area, which is managed by WIROM GAS SA. In this sense, we insert the approval notice obtained from WIROM GAS S.A.:

Fire extinction systems

For fire extinguishing, the investment will have its own water intangible supply, or, if applicable, specific extinguishing substances (dry powder, foam). The extinguishing substance supplies will be ensured based on the regulation in force, especially P118-2/2013

The heating installation

The heat necessary for heating and preparing the warm meals necessary is obtained by means of a forced air boiler, located in the boiler room, specially built for this purpose. The boiler's equipment ensures its operation with a

minimum 90% yield due to the automation of the thermal energy production process.

The boiler, the equipment, the room where the boiler and its machinery are located will comply with the provisions of rule I13/1994 for this type of work.

12.4. The access

From the point of view of the access to the land proposed for the investment, it is possible to access the site taking the – DN 4 – state road, to the Oltenita harbour area (end of the road), following the harbour street (Strada Portului) for approximately 970 meters (rehabilitated road). In order to access the investment, one must take Strada Portului (the harbour street) on a rehabilitated road of approximately 200 meters.

II. TECHONOLOGICAL PROCESSES

1. Construction time

During the development period, the main activities are related to the supply of the objective with materials and putting them into the activity.

1.1. Traffic pertaining to the development works

Performing the development works of the platforms imply a special category of specific means, indispensable for this type of works, that is:

- machines to perform the works
-means for the transport of the construction materials in the location of the objective

The actual work traffic in the location shall be represented by moving the necessary vehicles for the transport of the construction materials, for the transport of the waste resulted in the execution period, as well as for other activities

related (fuel transport for machines, transport of water and food for the execution personnel, personal transport for supervision and control, etc.).

The work traffic was dimensioned and assessed in accordance with the following elements:

- the volume of the materials that have to be transported to the location
- the category of materials that have to be transported: clay, ballast, cement, concrete, bituminous emulsion, asphalt concrete, prefabricated components, etc.;
- the existing category of vehicles (capacity) and the specific fuel consumption;
- the period of time for the execution of the different types works;
- the local access roads in the location and their lengths: 5– 10 km.
- the mean traffic speed: 20-25 (30) km/h;
- the time periods necessary for the loading/ unloading operations: between 10-30 minutes.

The main transport activities of the materials necessary for the construction of transom are:

- clay transport
- transport of concrete from the work site
- transport of asphalt concrete from the work site
- transport of prefabricated components and other materials
- other transports

Taking into consideration the calculation elements previously presented, the following details pertaining to the work traffic in the location have been determined:

- the type of the specific vehicle for the transport of a certain material
- the number of vehicles necessary for the transport of the respective material
- the maximum distance from the loading point to the work point (on access roads and in the location)
- the total number of kilometres that were covered
- fuel consumption, traffic intensity

2. Functioning period

The functioning period implies activities of refining waste oils.

Technological flow:

Generally, the procedure consists of recovering the main stock of lubes from the waste lubes by purifying them through hydrotreating process to produce API Gr.II + oils. The process is completed after doing the following operations:

i. Pre-treatment and filtration
ii. Dehydration and disposal fuel oil
iii. Distillation
iv. Separating and stripping the oil form water

- The pre-treatment and filtration stage:

This stage implies the selection and filtration of the supply material, for an adequate functioning of the plant. The supply material from the tanks is tested firstly to see which are its characteristics, because it does not have to contain compounds like waste lube, as requested by the local authority. The water content in the supply material of the waste lube must be as low as possible and must not exceed 10%.

The material received from the cistern is firstly filtrated with double basket (F-1001 A/B) at the microns dimension <1000 and then through the pump of the supply material collector (P-1001 A/ B) it reaches the storage tank of the supply material (T-1001A/B/C). According to the tank that reached the necessary retention time, the material shall be used to supply the refining plant with waste lube through the transfer pump for the supply material (P-1002). The self-cleaning filters are used for the subsequent filtration of the waste lube at the micron dimension <100. The supply material passes through the self-cleaning filter (SCF) (F1002 A/ B/ C/ D) placed parallelly through the transfer pump.

(P-1002) which works at a flow of 9,5 m3/h and 3,5 bar-g. The sludge from the self-cleaning filter (SCF) (F-1002 A/B/C/D) is sent back to the settling tanks. The caustic solution having a concentration of 40-48% which is stored in the storage tank for the (caustic) chemical substances (T-1002) shall be injected in the waste lube through the injection pump of the (caustic) chemical substances (P-1003) at a speed of 50-150 kg/ h at 3-3,5 bar-g to neutralise and maintain the PH of the waste lube.

The filtrate is then ready to be sent to the dehydrating section to remove volatile compounds and water (this procedure is described separately in the dehydration section). Once water is removed from the waste lube, this shall pass through a heat recovery changer where the dehydration supply material recovers the heat by means of heat changer (E-1001). The dried oil (dehydrated) is cooled until it reaches 90 °C in this changer by means of supply flow of waste oil which passes through another part of the changer. As a final stage of the filtration process, the supply material goes then through the centrifuge where the majority of the fatty components together with the fine particles (<100 microns) which can clog or pollute the surface of the evaporators in the distillation area. The solid particles in the centrifuge shall be directed to the settling tank. The filtrate in the centrifuge shall then be supplied in the fuel separation section.

- The dehydrating and recovery section of the fuel:
- Process area (dehydration):

In this section, the water in the supply material of the waste lube is eliminated. Like water, the components which have a boiling point lower than water shall be separated from the waste lube. The pre-heater and the special vaporised are used to completely dry the supply material. The supply material filtered by the self-cleaning filter (SCF) (F-1002 A/ B / C / D) in the filtration section shall be pre-heated in a pre-heater/ changer (E-1006) at 120 degrees C by means of the liquid heater and shall be treated in the vaporiser.

that was specially created E-1007. The supply material shall be in the pipes and the heating shall be ensured by the liquid heater.

A line recirculated from the transfer pump of the dried oil (P-1006) shall also be supplied towards the DH vaporiser (E-1007). This excess flow together with the waste lube shall reduce to a minimum value the soiling of the tubes of the vaporiser and, thus, the maintenance time shall be reduced. The process from the DH vaporiser (E1007) takes place in a lower void (100-200 mbar-a) and at a temperature of approximately 130-150 degrees C. The transfer pump of the dured oil (P1006) shall be centrifuge pump with double mechanical sealing assembly. P1006 shall work at 3,5 bar-g.

The low pressure (vacuum) in the system shall be ensured and maintained by the vacuum pump (ring with liquid type). The void level can be controlled through a control valve installed at the vent for the evacuation of vapours from the condensate storage vessel. The presence of the void system, the volatile products (solvents) having a boiling point lower than <130 degrees. C and the water starts to vaporise in the tubes of the DH vaporiser (E-1007), and then the liquid and vapours shall be separated in the dry oil separator (V-1001).

The separated vapours shall be condensed in a superior WEF condenser (E1008) and the condensed liquid (oil + water) shall be collected in the condensate storage vessel. The cooling water shall be used as a cooling agent in the WEF condenser (E-1008). The temperature of the output cooling water shall have a maximum temperature of 40 degrees C for all users. The condensed liquid shall be sent further in the section of separating oil from water (1057-SCOP-P-PFD-1010-AX1) in order to separate the oil from water by means of the condensation transfer centrifuge pump WLE (P-1007) at 3,5 bar g.

This dried oil that is in the inferior part of the dried oil separator (V-1001) shall be sent in the centrifuging area (pretreatment section) in order to separate the solids at the transfer pump of the dried oil (P-1006). The level in the dried oil separator (V-1001) and the storage vessel of the condensation (V-1002) shall be controlled through a level tool and a control valve.

Process area (separating the fuel):

From the centrifugal area of the pre-treatment section (1057-GOAL-P-PFD-1001-02-AX1) the filtered supply material enters the preheater of the oil fuel (E1011) at approximately 90 °C. In this section, the glycols and the fuels shall be separated. The supply material is firstly heated at 260 degrees C by means of liquid heater in the preheater of oil fuel (E-1011) and then is sent to the vaporiser for oil fuel especially designed (E-1012).

The system works at a pressure of <100 mbar and at a temperature of approximately 260 degrees C. A recirculation line from the recirculation and transfer pump of the oil ((P-1011) is connected to the supply material before entering the vaporiser. The oil recirculation and transfer pump (P-1011) is a centrifugal pump that has a double mechanical sealing. The oil shall be evaporated and the mixed flow shall be separated in the oil fuel separator (V-1006). The separated vapours shall be condensed in an oil fuel condenser (E-1013) by means of the cooling water acting as a cooling agent. This is a special designed condenser and it shall be in a vertical execution (U tube). The condensed oil shall be collected in an oil fuel condensation storage vessel which is placed in the inferior part (V1007). The uncondensed liquid and vapours shall be separated in the storage vessel of the condensed oil fuel (V-1007). The separated liquid in the storage vessel of the condensed oil fuel (V-1007) shall be transferred to the section of separating water and oil (AX1 1057 GOAL-P-PFD-1010-) to separate glycol from fuel by means of the transfer pump of condensation / oil fuel (P-1012). The transfer pump of the condensation / oil fuel (P-1012) is a centrifugal pump.

The separated liquid (oil) shall be transferred from the oil fuel separator (V1006) in the following stage, that is for the distillation process in order to recover the main stock of lube by means of the oil recirculation and transfer

pump (P-1011). The oil recirculation and transfer pump (P-1011) is, also, a centrifugal pump that has a double mechanical sealing.

The thermal oil having a low temperature shall be used for the circulation in the pre-heaters and vaporisers in the heavy distilled and fuel recovery section. The thermal oil supply temperature shall be of approximately 5 bar-g and 300 degrees C and it shall return to the preheater at 285 degrees C.

o Void system of the separation area of the heavy distilled and fuel:

The void in the fuel dehydration and separation shall be maintained by a pump intended for the separation of the heavy distilled and oil fuel (X-1001). For this purpose, a void pump with liquid ring (oil/ water) shall be used. The oil being a sealing liquid is recommended for the functioning of LRP, because the oil has vapour pressures greater than water and it shall not vaporise when the void system functions. Also, together with the water it could be necessary to install a cooling system for the same process. The condensation engaged from the oil fuel condensation storage vessel (V-1007) in the separation sections of fuel and water shall be condensed by means of the engaging condensator. The engaged condensation is stored in the liquid separator. (V1011), and the condensed liquid is sent to the water -oil separation section (1057-GOAL-P-PFD-1010-AX1) through the transfer pump for the transfer pump for the captured liquid (P-1016) is a pump type AODD.

The void pump with liquid ring pulls the vapours from the captured liquid separator (V-1011) and it evacuates them to the evacuation separator (V-1012). This pump needs a constant liquid flow to create a sealing inside the pump at a constant temperature. The liquid and vapours in the LRP shall be separated in an evacuation separator (V1012). The gas component shall be separated and the sealing liquid shall be recirculated through the liquid recirculation pump (P-1017) which will be a centrifugal pump. The sealing liquid circulates through the recirculation liquid (E-1017) and cools down before entering the LRP. The evacuation pump of the oil shall be of approximately 50 degrees C. The water

used as cooling agent at the input vent shall have 32 degrees C. and the evacuation pump for the cooling water shall have 40 degrees C.

The residual gas in the void system shall be sent to be evacuated in the liquid thermal heater.

- The section of the recovery of the distilled:
- o Process area:

The oil in the oil recirculation and transfer pump (P-1011) shall be redirected to a preheater (E-1021) to further heat the oil until it reaches a temperature of 300 degrees C by means of the thermal liquid. The thermal liquid system for this area shall have high temperature, the entry of the thermal liquid in the pre-heater (E-1021) being of 365 -380 degrees C. (the beginning of the cycle - the end of the cycle). The output temperature of the thermal liquid shall be of 350 - 365 degrees C. The pressure shall depend on the type of thermal liquid that is used. If it used liquid with a low pressure of the vapours, then it shall be necessary to use N2 in the system to suppress form a thermal point of view the pressure of the vapours of the thermal liquid. The typical range of the work pressure for the thermal liquid having a high temperature is 6,5 bar-g - 9 bsar-g. This shall be later confirmed according to the type of thermal liquid that is used.

The preheated process oil will then enter the distilled vaporiser that was specially created (E-1022). The pipes of the vaporiser will be made of stainless steel (SS-304L). The medium distilled vaporiser (E-1022) works in void at approximately 5-12 mbar-a and at a input temperature of the thermal liquid of 365-380 degrees C. (the beginning of the cycle - the end of the cycle).

The vapours that are generated in the medium distilled vaporiser ((E-1022) shall be separated in the intermediary residue separator (V-1016). The liquid part is pumped in the inferior part of the separator towards the next section in order to recover the heavy distilled through the intermediary residue transfer pump (P-1012). The intermediary residue transfer pump (P-1012) is a centrifugal pump equipped with

double mechanical sealing. The stainless steel construction SS-304L is recommended for this application.

The vapours separated in the intermediary residue separator (V-1016) shall be condensed un the middle distillation condenser. The middle distillation condenser (E-1023) is a vertical condenser U-tube type. The vapours shall be condensed and then refrigerated (up to 50 °C) un the medium distilled condenser by means of the circulation of the cooling water. The condensed liquid shall be collected in the storage vessel of the medium distilled (V-1017). The collected liquid oil is an intermediary product (oil of medium density) and it will be transferred to the intermediary storage tank to be sent to the next processing stage (hydro-treatment). The vapours that cannot be condensed will also be separated in the storage vessel of the medium distilled (V-1017).

o The vacuum system of the area of recovery of the medium distilled.

The constant moderate void of 5-15 mbar will be maintained in the section by means of the void system. For this process a void system with dry pump is recommended. An auxiliary device will raise the void level, increasing the flow and it will also help to reduce the pressure value. Usually, the auxiliary devices operate a ratio of 1:10. Thus, the final load of the backup pump will decrease.

The vapours in the storage vessel of the medium distilled (V-1017) will pass through the condenser -2 (E-1024) to condensate the material taken from the process. This shall be collected in a vessel for the separation of the liquid (V-1018). The condensed oil is sent to the water -oil separation section (1057-GOAL-P-PFD-1010-AX1) through the transfer pump for the captured liquid (P-1023) which is a pump with a double pneumatic membrane.

The auxiliary pump (the blower)(B-1001) is used to obtain a bigger void and to evacuate it in the next gauge of the void system. The auxiliary device will be a blower with profiled pistons. The vapours that go out of the blower are further condensed and cooled (up to 50 °C) in a condensator 3 entrainment (E-1025). After this separator, the vapours that were not condensed shall be pulled with void pump. A void pump dry vertical cam type

(X-1006) will be used in this process. This pump does not need to be circulated in a sealing liquid, as it is requested in the case of the void pump (X-1006) in the recovery area of the fuel and the heavy distilled.

The condensate captured at the evacuation vent of the void pump, that is V-1019, will be transferred to the water - oil separation section through the liquid transfer pump P-1024 (with double pneumatic membrane). The residual gas in the void system shall be sent to be evacuated in the liquid thermal heater.

- The area for the recovery of the heavy distilled:

The residues in the medium distilled vaporiser (E-1022) are firstly heated up to 310-320 degrees C. in the heavy distilled pre-heater (E-1031), before being supplied in the vaporisers with film E-1032/1041/1051/1061. In the plant there are 4 film vaporisers. They are similar in execution and they shall be operated in parallel, that is each film vaporiser will be constantly supplied by means of an intermediary residue transfer pump (P-1021) in the recovery area of the medium distilled. The input temperature (365 °C) and the output temperature (380 °C) of the thermal liquid will be used to heat through the area of the encasing of the pre-heater and the film vaporisers. The arrangement of the film vaporisers is explained below. The total advancement speed of the supply material of the pre-heater of heavy distilled (E-1031) will be 3600 - 4000 kg/h. The supply material will be equally supplied to the 4 film vaporisers at a speed of 900 -1000 kg/h to the film vaporisers E-1032/1041/1051/1061.

o Typical construction and work principles of the film vaporisers:

- supply material
- distilled
- residue
- heat
- cooling
- void

The film vaporiser (also named ”thin film vaporiser) consists of 2 main assemblies:

1. Heated body
2. Rotor

- The product enters above the heated area and it is evenly distributed by the rotor on the interior surface of the unit. Once the product begins to descend lower, doing a spiral on the wall, the arc waves developed by the rotor blades generate an extremely turbulent flow, leading to an optimum heat flow and a mass transfer.
- The volatile component evaporates quickly. The vapours move through the unit, either counter-current, either in current, according to the application. In both cases, the vapours are ready for condensation or further process.
- The non-volatile components are evacuated at the exit towards the void system.
- The continuous wash of the non-volatile components by the waves minimizes the soil of the thermal wall where the product or the residue has the highest concentration.
- The combination between

a. Extremely short sedimentation time

b. The distribution of the short sedimentation time

c. Serious turbulence and fast renewal of the surface allows the film vaporiser to adequately manipulate the liquids which are sensitive to heat, which are thick and favours sedimentation.

o Description of the process in the area of the film vaporisers:

The product obtained from the film vaporisers E-1032/1041/1051/1061 at 0,5-1 mbar-a and at 310-330 °C (process temperature) is a ”heavy distilled” and the by-product is ”bituminous residue” The condenser integrated in the film vaporiser will condense the generated vapours in the film vaporiser. The heavy- distilled is refrigerated and then condensed at 50 °C liquid in the heavy distilled condenser (E-1033/E-1042 / E-1052 / E-1062)

heavy distilled and it is collected in the storage vessel for the heavy distilled (V-1021/1031/1041/1051) respective for the film vaporisers E-1032/1041/1051/ 1061. The heavy distilled that is collected is transferred to the storage tank of the heavy distilled / daily storage tank of the heavy distilled through the transfer pump of the heavy distilled (P-1031/1041/1051/1061) to be further processed in the hydro-treatment area 3,5 bar-g. P-1031/1041/1051/1061. The pump will be equipped with gears on execution and it will work at 3.5 bar-g. The thermal liquid circulates in the area of the encasing at 365 degrees C. (the beginning of the cycle – end of the cycle) and the output temperature of the thermal liquid of the film vaporiser will be 350 degrees C. (beginning of the cycle – end of the cycle). The encasing of the film vaporiser will be covered on the inside with SS-316L/ SS-304L according to the standards of the producer. The layer of the encasing will be made of CS (SA 516 Gr. 70 N) in execution.

The bituminous residue is a by-product of the vaporiser. It is collected in the residue tank (V-1022/1032/1042/1052) pertaining to the film vaporiser and it is transferred in the storage tank for the bituminous residue (at 3,5 bar-g) with the help of the residue transfer pump (P-1032/1042/1052/1062). The residue transfer pump are pumps with gears. The bitumen pump must have an internal heating system. Remember that the bituminous residue can solidify under 110 degrees C. As a result, all lines and equipment pertaining to the exploitation of the bitumen must have a heating system (thermal traceability), to ensure their drainage and maintenance.

o Void system for the recovery area of the heavy condensed:

There are four film vaporisers in this process and each has its own void system. Below you will find typical information for the void functioning in the plant; Still, these can be changed according to the requirements of the supplier and the type of system that is used. The following description must be read for each film vaporiser.

The film vaporisers function in a void of 0,1 - 1 mbar-a which is maintained in the system by means of the void system. The vapours in the

residue storage tank (V-1022/1032/1042/1052) go through the entrainment condenser (E-1034/ 1043/ 1053/ 1063) to capture the liquids. The condensed liquid will be collected in the liquid condenser V(1023/1033/1043/1053) and it will be transferred to the water-oil separation section (1057-GOAL-P-PFD-1010-AX1) by means of the transfer pump of the captured liquid (P1033/ 1043/ 1053/ 1063). This will be a pump with a double pneumatic membrane.

In the heavy distilled section, in order to generate a void in the system is, usually, necessary to install 2 auxiliary devices + 1 support pump/ void pump. Still, this thing will be confirmed after the discussions with the seller.

The vapours in the separator for the captured liquid (V-1023/1033/1043/1053) will be transferred in the void pump by 2 void devices together with the coolers in the evacuation vent of each auxiliary device and the captors will be used to capture/ collect matter which can be condensed during the functioning of the plant. The condensed liquid will be collected and transferred to the separation section of water and oil by means of the transfer pump for the captured liquid (P-1024/1034/1044/1054).

The final void pump will be equipped with liquid ring. This needs a constant flow of liquid at a constant temperature to create the film inside the pump and, thus developing the void in the system. This thing will be ensured by means of a liquid re-circulation assembly.

The final void pump for the recovery of the heavy distilled (X1011/1016/1021/1026) is a void pump with liquid ring which sucks out the vapours in the captured liquid separator(V-1025/ 1035/ 1045/ 1055) in an intermediary captor and evacuates it in the evacuation separator (V-1026/1036/1046/1056). The void pump needs a constant flow of liquid at a constant temperature to create the film inside the pump and, thus developing the sealing liquid inside the pump. This thing will be ensured by means of a liquid recirculation pump (P-1035/1045/1055/1065) with the help of the circulating liquid cooler (E-1036/1045/1055/1065). The vapours extracted from the process will be evacuated at the unloading separator (V-1026/1036/1046/1056) together with the re-circulation liquid. The vapours will be separated here in the separator for

the unloading (V-1026/1036/1046/1056). The separated vapours will then be sent to the thermal liquid heater room to be destroyed.

- The water-oil separator and stripping system.

In this section, the oily wastewaters are sent to the water-oil separator (T-1011) and it works on the principle of the difference in gravity. Due to the difference in gravity, the oil will float on the surface of the water. The specially designed internal components will act as a coalescer and, thus, big drops of oil will be formed. Thus, the efficiency of the oil and water separation is increased.

The individually separated oil and water in the storage tank of the oil fuel (V-1061) and in the tank for the wastewater (V-1062). The collected oil will be transferred trough the fuel transfer pump (P-1071) to the storage tank for the oil fuel and the water in the storage tank for wastewater (V-1062) will be transferred for stripping by means of the intermediary transfer pump for wastewater (P-1072) to remove the dissolved impurities.

For the stripping of the chlorinated compounds, which are lighter and have more ammonium, H2S and of the mercaptans etc. to take place, this must pass through stripping installation for wastewater (C-1001) and through the pre-heater. The wastewater is heated at 60 °C, before entering the column so that it can be stripped. Temperature is an important parameter for the separation; as a result, the water must be heated with the help of the pre-heater to have an efficient separation of the dissolved impurities. The wastewater is transferred through this system by means of P-1072 (the intermediary transfer pump for wastewater) In the wastewater stripping installation (C1001), the air passes through the sealing layer in the column to extract the components in the waste water. Then the water is transferred to the wastewater treatment system through the wastewater transfer pump. P-1073). The wastewater cooler (E-1072) of the cooler installed in the middle will cool the water at 50 degrees C. The waste water transfer pumps (P-1073/1072/1073) are centrifugal. The oil and water transfer pump work at 3.5 bar-g.

The residual gas form the upper part of the water-oil separator (TK-1011) and from the stripping installation (C-1001) will be eliminated in the room of the thermal liquid heater.

The safety valves are installed on all critical equipment to protect them against over-pressurisation, fire and other scenarios regarding safety. The evacuation vents of the safety valves are connected to the system of management of the emergency situations (flame system). The liquid will be captured in the KO vessel and the gas will be eliminated/ oxidized through the burner.

The technological process of the installation and the effluent of each step of the process:

a. Dehydration

Dehydration is obtained by heating the waste oil in a specialised equipment. From this process, a number of 3986 t/ year vapours will result, consisting of a mixture of steam and volatile components. The water is then condensed and sent to the chemically impure storage system. The volatile components are used as gas fuel with low calorific power, in the furnace of the installation or burnt.

Input: 66.666 t/year waste oil

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 62.680 t/year dehydrated waste oil, 3986 t/year wastewater

b. The separation of the liquid fuel (diesel fuel).

The installation consists of an vacuum evaporator. A quantity of 6680 t/ year will be extracted from the waste oil. This will be used in the furnace, but it will supply the hydro-treatment installation.

Input: 62.680 t/year dehydrated waste oil

Utilities: heat, under the form of hot re-circulated oil and cooling water.

Products: 56.000 t/year supply with film evaporator, 6680 t/ year liquid fuel

c. Oil separation

The main product for the fuel separator will supply the film evaporators (Falling Film Evaporator & Wiped Film Evaporator). The separation is made under vacuum.
The residue (bitumen) form the film evaporator, 9320 t/ year will be sold as road bitumen.
Input: 56.000 t/ year
Utilities: heat, under the form of hot re-circulated oil and cooling water. Products:
46,680 t/year from the film evaporator, 9,320 t/year bitumen

d. Hydro-treatment

The oil recovered from the film evaporators is treated with hydrogen in this installation to produce the high quality oil base. The oils from the evaporators are treated in the presence of a special catalyser, at a temperature of 360 C and at a pressure of 96 bar. The main resulted product is the oil base. The sulphur in the raw material is extracted under the form of hydrogen sulfide (H2S). This will be extracted from the hydrogen flow with the help of the amine installation. A part of the re-circulated oxygen flow will be burnt as fuel in the furnace to maintain the light hydrocarbon concentration at the desired level.

Input: 46.680 t/ year from the film evaporators, 3624 t/ year hydrogen
Utilities: heat, under the form of hot re-circulated oil and cooling water. Products: 45.624 t/an hydro-treated oil base, 680 t/ year gas rich in hydrogen, used as fuel in the technological furnace.

e. Final breakage

The hydro-treated oil is broken into the distillation column to produce oil bases with the degrees SN-150 or SN-500. In the same breakage column the light breakages are extracted to meet the specifications of the SN-150 and SN-500 products.

f. The hydrogen installation

The hydrogen necessary for the hydro-treatment installation is produced through water electrolysis

The resulted oxygen will be released into the air.

Input: 4.285 t/ year demineralised water

Utilities: electricity, cooling water.

Products: 360 t/ year hydrogen

g. Amine installation

The gas mixture rich in hydrogen, produced in the hydro-treatment reactors, also contains H2S. The gas is sent to the amine installation to eliminate H2S. The gas mixture rich in hydrogen which is filtrated is re-circulated in the hydro-treatment installation, while the H2S is burnt. The maximum quantity of H2S is 24 kg/ h (192 t/ year).

III. WASTE

1. Sources of waste, waste management, waste elimination and recycling

1.1. Types and quantity of waste

1.1.1. Construction time

Through Government Decision no. 856/2002 for the Inventory of the waste management and for the approval of the list containing waste, including hazardous waste it is established that

the economic operators and any other waste generators, natural or legal persons, have the obligation to keep an inventory of the waste management.

According to the abovementioned list, the waste resulted from the construction activity are classified as follows:

17.01.07 concrete, bricks, ceramic materials;

17.02.01 wood;

17.02.03 plastic materials;

17.04 metals including alloys;

17.05 soil and excavated materials;

17.09.00 waste mixed with construction materials;

In the construction phase, inert waste will result. These will be eliminated based on the concluded service agreement.

From the excavation activities necessary for the foundations it will result waste soil and excavated materials, plant debris, stone and rocks.

The works will be performed according to the construction quality norms so that the resulted waste quantity is limited to a minimum value.

From the personnel hired for the construction work domestic waste will result which will be collected by means of the sanitation services company which also collects the remaining domestic waste in the location.

The total quantity of the waste is determined according to the total number of people hired on the work site and the execution period of the works.

1.1.2 Functioning period

The residue generated during the existence of the production unit are divided in 2 categories:

- domestic waste
- technological waste

Domestic waste will be collected in plastic bins which will be deposited on a platform in the location.

Technological waste is divided into 2 categories:

- recoverable
- non-recoverable

The technological waste comes from different operations executed in the unit. These can be divided in several categories:

- other fuel, including mixtures
- unspecified oily waste
- hydraulic oils with PCB content
- other hydraulic waste
- other transmission oil, motor oil and lubes
- other isolating oil and for the transmission of heat
- waste from the separation of oil from water
- sludge from the oil water separators
- oily water from the oil water separators
- packaging polluted with dangerous substances
- contaminated filters

The machines and means of transport will be brought on the work site in a normal state of functioning having the all the technical revisions and oil changes performed in specialized shops.

The same procedure will be applied for the maintenance operations and charging the accumulators etc. which will be performed only in specialised shops.

It is difficult to make a quantitative assessment of the waste, the technologies adopted by the contractor having priority for the assessment of the nature and quantity of waste.

The activities on the work site will be monitored from the point of view of environment protection, monitoring which will contain the management of waste.

2. Waste management

2.1. Construction time

The separate collection of waste is requested, by performing the following procedures:

- setting the collection site, logistic acquisition and equipment (machines, vehicles, bins of different size and colour for all categories of waste) and the organisation of the collection on the centralized system from the source.
- the separation of waste in central locations
- standardization of the waste collection and transport systems through:
- containers for waste and their location
- collection containers
- transport vehicles

From the point of view of the containers, separate containers must be supplied for each type of resulted waste. For hazardous and toxic substances, special storage places must be set.

The size of the containers should be 1.100 litres, with slots and covers with locks to prevent people from searching through them. Four or five containers of 1.100 litres each should ensure the necessary quantity for recycling.

The bins should be carefully positioned, taking into consideration the easy access to them, both by people and by the collection vehicles, in any type of weather. The containers must be placed on a solid platform, with a border on three sides and the access must be made on the road side so that the collection operators can move the bins towards the vehicle and stop the vehicles with the rear part next to the containers. The areas where the containers are placed must be kept clean (make sure the operators also collect the waste that has been thrown next to the bins), they must be illuminated and covered to prevent rain from entering, for example.

2.2. Functioning period

The separate collection of waste is requested, by performing the following procedures:

- setting the collection site, logistic acquisition and equipment (machines, vehicles, bins of different size and colour for all categories of waste) and the organisation of the collection on the centralized system from the source.
- the separation of waste in central locations
- cleaning the halls and access roads by sweeping them, removing rubbish and setting wastebins
- standardization of the waste collection and transport systems through:
- containers for waste and their location
- collection containers
- transport vehicles

During the functioning period, the areas where the containers are placed must be kept clean (make sure the operators also collect the waste that has been thrown next to the bins), they must be illuminated and covered to prevent rain from entering, for example. It is necessary to set separate bins for each type of waste: biodegradable (domestic), paper, plastic, etc.

For an easy identification, they will use bins marked with the type of waste that can be collected. In this way, the personnel is instructed regarding the way of throwing the waste. The bins must follow the colour code and they must be placed on a concrete platform in an area especially set for waste.

For the hazardous waste special containers will be ensured that they will be deposited separately in a different area and they will also be secured. Liquid waste which contain dangerous substances will be collected in cubitainers, secured with sand plate under each container to prevent the pollution of the soil with dangerous substances.

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

The reactors in the hydro-treatment section need to have their catalyser replaced once every 6 months. These catalysers will not contaminate the environment, but they will be sent to the initial supplier to regenerate and recycle them.

3. Toxic and dangerous substances, use, marketed

3.1. Construction time

The toxic and dangerous substances that are used are:

- diesel fuel
- paints and diluents

The diesel fuel will be stored in the tanks that the city hall has and which are set according to the legal requirements.

Paints and diluents will be stored under strict protection conditions, in specially-designed and secured places. The storage tanks must be made of metal, with a capacity of 200 l and the warehouse will be equipped with a concrete platform and it will be secured with gutter to avoid accidental spills.

3.2. Functioning period

Activities which imply the use of toxic and dangerous substances will be developed in the company. All chemical products that are used will be purchased only from authorised suppliers for which a monthly inventory register will be kept.

The maximum quantity of dangerous substances that can be stored in the location, as well as the maximum quantities foreseen to be used annually are presented in Table no.1.

This table includes information on the physical state of the dangerous substances foreseen to be used, as well as the storage / manipulation and the requirements for the storage of the substances until they are used in the technological process.

A register of the dangerous substances will be kept and the Prevention and control of accidental pollution plan will be implemented according to the specific regulations of the national legislation.

The quantities of chemical substances declared by the beneficiary have been assessed taking into consideration the Security Data Sheet for each product according to the provisions of Law no. 59/ 2016, Annex 1, Part I and Part II, being highlighted the maximum quantities that are present on each component.

Under these conditions, the sum of relevant quantities of chemical substances in the storage areas existing in the location determine if the location meets the inferior values described in Law no. 59/ 2016.

In Table no.1 1 – The chemical substances used in the production process (according to the provisions of Law no. 59/ 2016, Annex 1) are presented all the dangerous chemical substances existing in the location and their sum according to the Note to Annex 1.

Crt. No.	Name of the stored product/ dangerous substance	CAS no.	Classification (67/548/CEE/ 99/45/EC)	Classification (1272/ 2008/ CE)	Storage place	Warehouse capacity (t)	Physical condition	Storage handling method	Storage conditions	Relevant quantities (acc. to		
										Inf. Level	Sup. Level	qx/Qx
1	**Used Lube Oil**	70514 -12-4	R66, R45, R52, R53	H227, H304, H350, H336, H315, H412	tank metallic storage	5849	liquid	cistern	4 tanks metallic, capacity 1 x 107 cm and 3 m^3	2500	25000	2,33
2	**Diesel/Light Oil**	64741 -77-1	Unclassified	H304	tank metallic storage	718	liquid	cistern	metallic tank with walls double above ground 1 x 473 cm and 1 x 245 cm	2500	25000	0,28
3	**Middle Distilled**	64742 -54-7	Unclassified	It is not available	tank metallic condensed storage	1864	liquid	cistern	2 tanks metallic above ground 930 cm and 1 x 934 cm	-	-	0
4	**Heavy Distilled**	64741 -76-0	Unclassified	It is not available	tank metallic storage condensed	1879	liquid	cistern	two metallic tanks above ground 945 cm and 1 x 934 cm	-	-	0
5	**Heavy Lubricating**	8052 -42-4	Unclassified	It is not available	tank	488	solid	cistern	2 tanks x 244 cm	-	-	0
6	**Caustic Soda**	1310 -73-2	H314	R35	tank anti-corrosive	65,89	solid	cistern	1 x 54,89 cm s 11 cubic meters	50	200	1,31
												3,92

IV. THE POTENTIAL IMPACT, INCLUDING THE CROSS-BORDER IMPACT ON THE COMPONENTS OF THE ENVIRONMENT AND MEASURES TO REDUCE THEM

1. Water

1.1. Main information on the body of water

Current situation

The hydro-graphic network is completely tributary to the Danube river which delimitates the county in the south and south-east. Except the rivers Argeș and Dâmbovița, which through their inferior sectors drains the south-east part of the county, the other rivers that are of smaller importance, belong to the local network. Out of these we mention: Mostiștea, with springs in Ialomița county, as well as in the system Barza-Galatui. It is important to notice that in the north-east of the county, the hydrographic network is close to zero, the only surface with water on this area is Lake Jegalia. The Danube crosses the county on a distance of 154 km, from Cascioarele to Fetești-Cernavodă railway in Balta Borcei. Close to the border crossing point Chiciu (situated at a distance of 8 km upstream form Călărași), the Danube breaks up in 2 arms: Borcea, on the left and the Old Danube on the right which delimits Călărași county from Constanța county.

On the left bank of Borcea, an industrial channel (10km long) was made to allow the crafts that bring the raw materials to reach S.C. Donasid S.A.. Also, a port equipped with loading / unloading installations and berths for ships. A modern bridge (it has 4 traffic lanes) goes over the channel and it connects the city to the Danube crossing point in Chiciu-Ostrov (Constanța county), at the same time being an excellent fishing spot and a place to train for water sports. Between the two arms that enclose the Balta Borcei, there is a direct link through Brăila arm which plays an important role regarding the flows on the 2 arms. The average annual flow of the river is 5470 cubic meters/ s at the entry point in the county. Argeș river enters the county

close to Budești locality and discharges in the Danube, in Oltenița, crossing Călărași county on a length of 37 km. The average annual flow is smaller when entering the county (56 cm/s) and increases at discharge (73 cm/s) as a result of the water from Dâmbovița river. Regarding the lakes, in Călărași county there are two anthropic lakes, represented by ponds spread on the valley of Mostiștea and its tributary: Rasa, Luica, Zboil, Barza and Pasărea. Out of the natural lakes the following must be mentioned: Mostistea, Galatui and Potcoava. The valley lakes are represented here by Boianu and Ceacu from the Danube Valley, Mitreni in Argeș valley and Tatarul in Dâmbovița valley.

1.1.2. Construction time

A. Pollutants emission in water and the protection of the quality of water

In construction activities, the intermediary warehouses (bulk) of construction materials (especially powdery are washed by rain water, the fine particles being taken to the auxiliary lands. To avoid any possible inconvenience generated by the presence of the temporary material warehouse it is recommended to set up storage platforms with protection gutters.

B. Pollutants flow and concentrations in comparison with the legal provisions in force.

Rain water, which can contain powders due to the temporary material warehouses, may enter the rivers under the conditions of observing the NTPA 001 provisions and the specific requirements imposed by the National Company Romanian Waters. For the water usage pertaining to the works, the regulations in force shall be taken into consideration:

− Environment Law

− Water Law

− NTPA 001 – respective the standard that establishes the concentrations of the pollutants in the water evacuated in the natural receivers.

For the reduction of the impact on the surface water, the following measures are necessary:

- covering the raw materials and materials warehouses to reduce the action of the wind
- periodical technical checks of the machines
- using new machines and trucks that have efficient systems of minimizing and retaining pollutants in the atmosphere
- periodically water the roads that are used by the construction machines, especially during the hot season.
- using liquid fuels for the machines and trucks which meet the regulations in force regarding pollution.

1.1.3. Functioning period

During the period of exploitation of the designed works, measures for the protection of water are not foreseen, this not being affected by the functioning of the objective

Waste water resulted from the gas stripping and the dehydration of the oil will be passed through a treatment installation before evacuating them in the public sewage system.

Once a year, the waste water for the cooling of the installation will also be evacuated. Before evacuating it in the public sewage system, it will pass through the treatment installation.

The unit will conclude a water supply and sewage contract with Ecoaqua SA Călărași to supply water to the objective and to discharge the waste water in the public sewage system.

The pollutants concentration and flows for the water evacuated in the environment

Table– Quality Indicators

Indicator	***MU***	***Permissible limit value N.T.P.A. 002/2002***	***Warning Threshold***
Biochemical oxygen consumption at five days (CBO_5)	mgO_2/l	300	210
Chemical oxygen consumption(C Cr)	mgO_2/l	500	350
Materials in suspension	mg/l	350	245

Indicator	***MU***	***Permissible limit value N.T.P.A. 002/2002***	***Warning Order no. 756/97***
Ammoniacal nitrogen (NH_4^+)	mg/l	30	21
Total Phosphorus (P)	mg/l	5	3.5

1.2. Water supply - Description of the supply sources of water

1.2.1 Current situation

Currently there is not a water network in the location, as it does not have constructions on it.

1.2.2. Construction time

The supply with drinking water during the construction works will be ensured from external sources: bottles water.

During the construction time:

– The excavations for the foundations and preparing the arming does not imply the use of water or generating waste water.

– Preparing the technological platform and access roads does not need water;

– The concrete which need technological water are prepared at the closest concrete plant and they are transported at the site using adequate equipment.

1.2.3. Functioning period

The water supply will be made from the public network of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA by means of connecting pipes.

The water from the public system will be used:

- for hygienic purposes by the employees of the company
- technological purposes(as steam, cooling facility agent (recirculating water)
- in the laboratory (the vessels will be washed)
- cleaning the area

- to ensure the PSI– it has a fire tank to fuel the hydrants, if needed.

The plant will use part of the technological processes, mainly demineralised water. The necessary steam is very small, mainly for the cleaning of the equipment, at stops. The void pumps do not need steam, like the conventional ejectors, using the best technology in the field.

The cooling needs will be ensured by a system of re-circulated water cooled in a cooling tower. Thus, possible leaks of oil products will not affect the groundwater, being a closed circuit.

1.3. Management of waste water

1.3.1. Current situation

Currently there are no waste water sources in the location.

1.3.2 Construction time

During the construction works, ecological toilets will be ensured for the entire personnel. These will be discharged by specialised companies or by the company that rents them, based on a contract.

Construction activities– mounting does not generate wastewater or polluted water.

1.3.3. Functioning period

The wastewater together with the water resulted from cleaning of the areas and those from the cleaning of the vessels in the laboratory will be evacuated by means of R1 connection to the public sewage system of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA.

Waste water resulted from the gas stripping and the dehydration of the oil will be passed through a treatment installation before evacuating them in the public sewage system.

Once a year, the waste water for the cooling of the installation will also be evacuated. Before evacuating it in the public sewage system, it will pass through the treatment installation.

Rain water will pass through a hydrocarbons separator and evacuated in the public sewage system, by means of R2 connection.

1.4. Forecasting the impact

1.4.1. Current situation

Not necessary

1.4.2 Construction time

During the construction time the uncontrolled use and storage of the construction materials must be avoided. Also, the equipment that it is used will have to be periodically checked to avoid technical malfunctions which lead to oil products loss.

1.4.3. Functioning period

If the evacuation parameters of the wastewater will be observed, the impact will be insignificant.

1.5. The visible impact on the ecosystems

1.5.1. Current situation

Currently, the ecosystems in the area are not affected

1.5.2. Construction time

During the construction of the objective, the main goal is to limit the interventions on the ecosystem so that the environment is not affected.

1.5.3. Functioning period

During the functioning period, the ecosystems around the objective will not have major changes, except the situations in which the rules for the protection of the environment are not followed.

Taking into consideration all the above and analysing the elements of the project, we consider that by performing and exploiting the objective, there will be zero effects on the ecosystem.

1.6. Possible accidental discharge of polluting substances1.6.1. Current situation

Currently, the possibility of discharging polluting substances does not exist.

1.6.2. Construction time

By permanently checking the technical status of the equipment used in the construction process, the possibility of discharging polluting substances is reduced to a minimum.

1.6.3 Functioning period

If the technical construction specifications and exploitation of the sewage system and the pre- treatment installations are fully met, there will not be any uncontrolled discharges of wastewater. The possible accidental discharges can appear when physical deterioration of the pipes that form the wastewater network are present.

1.7. The cross-border impact

1.7.1. Current situation

Currently, the possibility of a cross border pollution does not exist.

1.7.2. Construction time

During the construction time of the objective the possibility of a cross-border impact does not exist.

1.7.3. Functioning period

The possible disasters that can appear during the functioning of the refinery and which can affect the Bulgarian party are the following:

- Cracks in the storage tanks
- Floods

1.8 Measures to diminish the impact

1.8.1. Current situation

Currently, there aren't necessary measures to diminish the impact.

1.8.2 Construction time

To diminish the ecologic impact on the aquatic ecosystems during the construction works, the following are recommended:

- covering the raw materials and materials warehouses to reduce the action of the wind
- periodical technical checks of the machines
- using new machines and trucks that have efficient systems of minimizing and retaining pollutants in the atmosphere
- periodically water the roads that are used by the construction machines, especially during the hot season.
- using liquid fuels for the machines and trucks which meet the latest regulations
- avoiding biogenic, organic and toxic chemical input by washing the equipment used in the execution of the construction works;
- avoiding the modifications of the flow speed and depth of water in holes or material sedimentation on the bottom of the water.

Based on the objectives formulated by the Law in the protection of the environment, it is highlighted the danger represented by impurities and the modifications brought to the biotope by moving different construction materials from the work site the valleys of the rivers. It is considered that the construction activity adequately organised, the mentioned ecological risks, ensuring the protection of the biota and the maintaining the ecological balance.

1.8.3. Functioning period

The holder of the activity is obliged to:

take all necessary measures to prevent major accidents and to limit their consequences on the public health and on the environment;

inform the public authorities if an installation, a storage unit, the nature or quantity of dangerous substances existing in the location at that time is modified, modification which can have significant effects regarding the danger of major accidents;

provide for its own personnel and for the people who can be affected, if an accident occurs, accident generated by the objective, information on the security measures and on the necessary actions for the intervention

immediately inform the local public authorities on the civil protection and the environment protection, in case of a major accident

The unit must make an Intervention plan in case of accidental pollution.

According to the Intervention Plan, in case of accidental pollution, in order to fight pollution, the following are established:

List of critical points in the unit where pollution may occur;

The data sheet of the potential pollutant;

The measures and activities to prevent accidental pollution;

The members of the committee for the settlement of emergency situations with the responsibilities of the leaders;

The members of the committee for the prevention of accidental pollution;

The list containing the equipment and materials necessary to stop accidental pollution;

The procedure regarding the record of the information regarding accidental pollution;

The warning procedure in case of accidental pollution.

The plan will be revised annually and updated if necessary.

In the unit, the plan must be made available for the control bodies at any time.

Malfunction which can have major effects on the environment must be registered in written form. The following must emerge from the written records which have to be made available to the competent authority:

- Type, moment and duration of the malfunction,
- The quantity of the emitted toxic substances (if appropriate, an assessment is necessary),
- The consequences of the malfunction in the objective and outside the objective.
- All the initiated measures.

The malfunctions whose effects can spread on the entire surface of the objective or which are dangerous for the public health or life must be immediately communicated

- to the Directorate for Emergency Situations
- and to the authority responsible for the protection of the environment.

Regarding the danger of flooding the land, the unit will build on the platform the refining installation and the storage tanks in such manner that they will exceed the flooding limit.

2. Air

2.1. General Data

2.1.1. Climate and weather

The climate is continental, sometimes excessive, with hot and dry summers and cold winters, dominated by the frequent presence of the cold air masses from the East, or arctic from the North and by strong winds, blizzards.

2.1.2 Information on temperature, rainfall, wind, solar radiation, pollutant transport and diffusion conditions

A. A. Air temperature regime

The average multi-annual temperature shows relatively small differences, in the range of 10,8 and 11, 2 degrees Celsius. The average temperature of January is approximately -3 degrees Celsius.

This temperature of -3 degrees Celsius has great importance because it separates in the Kopen system the continental climates (c.f.) from the boreal climate. The average temperature of July is approximately 30 degrees Celsius.

The first day of freeze appears around the date of November 1 and the last one is registered around the date of April 11. It can be concluded that, from this point of view, which the vegetation period is quite long and the temperatures favour the evolution of the vegetation.

B. Precipitations

The average annual precipitations have a value of 560 mm. The precipitations are spread during the entire year, being at a higher value at the beginning of summer (the average sum of the precipitations in June reached the value of 76 mm). A decrease of the precipitations value occurs at the beginning of autumn and during winter (especially in February).

According to the seasons, the precipitations have the following values: winter 76 - 100 mm, spring 125 - 150 mm, summer 150 - 175 mm, autumn 100 - 125 mm.

The annual aridity value is 24 – 28.

Humidity

The average relative humidity is 72%. The lowest value is registered in July (61%) and the highest, in December (80%). During the vegetation period, the relative humidity is 64%.

C. Wind

The area is exposed to the action of the wind. The dominant winds

are the ones in the north-east and south-west, having the highest intensity in winter, reaching degrees 5-7 (according to the Beaufort scale) which corresponds to a speed of 27 - 54 km/h.

The maximum intensity of movement of the air masses takes place for a period of 10 days annually, being lower outside this period.

2.2. Sources and generated pollutants

2.2.1. Current situation

Currently, there are no sources which can pollute the air.

2.2.2. Construction time

The specific sources of the work site for exploitation and processing are:

Sources at the ground level.

Alternate sources.

Their existence is strictly limited to the functioning period of the work site.

They are not controllable according to Order 462/ 93.

The emission of pollutants is due to the evacuation of gas generated by the functioning of the engines of the work and transport vehicles and the air currents which engage the particles in suspension.

The pollutants that are specific for this stage pertain to the construction works and they are: particles in suspension and exhaust gas.

2.2.2.1. Works in the location

The emissions during the development of the works are associated with the movement of the ground, handling other materials, as well as building specific facilities.

The dust emissions often vary substantially form day to day, according to the level of activity, the specific operations and the dominant weather. A great part of these emissions is generated by the traffic in the location.

The temporary nature of the construction works differentiate them from other dust sources, both regarding estimations and the control of the emissions.

The works consist of a series of different operations, each with its own duration and potential for dust generation. In other words, the emissions in the location of a construction have a start and an end which can be accurately defined, but varies significantly from one stage to another of the construction process. These characteristics differentiate them from the majority of other dust sources whose emissions have either a relatively stationary cycle, either an annual cycle which is easy to highlight.

The execution of the works implies the use of equipment specific to the different category of operations which leads to the occurrence of certain s sources of pollutants specific to engines with internal combustion. Additionally, the supply with the necessary construction materials implies the use of the transport vehicles which, at their turn, generates pollutants specific to the engines with internal combustion.

The regime of the emissions of these pollutants is, just like in the case of dust emissions, dependent on the level of the activity and the specific operations, presenting a significant variability from one day to another, from one stage of the process to another.

As a result, the approach regarding the emissions from the execution works that is recommended in the developed countries (The European Environment Agency – EEA, The Environment Protection Agency in the USA – USA EPA) is based on taking into consideration the general works executed on the entire surface or, as appropriate, parts of this surface, leaving out the details of the execution plan for the project of a certain construction.

In the current work, taking into consideration the work type and volume, the types of materials involved in the process, the categories of specific operations as well as the proposed execution period, the pollution sources have been identified and the inventory of the specific emissions during an hour and the entire execution period.

A reduced part of the execution works includes operations which constitute a source of dust emission. These operations belong to the activity of handling the soil and the ballast, as well as the disturbance of the surfaces.

An additional dust source is represented by the erosion of the wind, phenomenon which accompanies the construction works. It appears due to the existence, for a certain period of time, of land surfaces which are not covered and which are exposed to the action of the wind.

The dust that is generated by handling the materials and by the wind is, mainly, of natural origin (soil particles, mineral dust).

The main activity stages which constitute sources of dust are:

- fillings
- spreading ballast

These dust sources are accompanied by pollutants emission sources specific to engines with internal combustion represented by the engines of the equipment which performs the respective operations.

Another source of pollutants specific to the engines with internal combustion is represented by the road traffic (vehicles that carry materials and products necessary for the construction)

The equipment, regardless of the type, work with diesel engines, the evacuated exhaust gas containing the entire complex of pollutants specific to the internal combustion of the diesel: nitrogen oxide ((NO_x), non-methane volatile organic compounds (COV_{nm}), methane (CH_4), carbon oxides (CO, CO_2), ammonium (NH_3), particles with heavy metals (Cd, CU, Cr, Ni, Se, Zn), polycyclic hydrocarbons (PAH), sulphur dioxide (SO_2).

The complex of organic and inorganic pollutants emitted in the atmosphere through the exhaust gas contains substances with different degrees of toxicity. Thus, beside the common pollutants (NO_x, SO_2, CO, particles), it is observed the presence of some substances that can cause a cancer shown by epidemiological studies made by the World Health Organisation: cadmium, nickel, chrome and polycyclic aromatic hydrocarbons (PAH). There are also present the nitrous oxide (NH_2O) – a substance that is responsible for the exhaustion of the stratospheric ozone layer – and the methane, which, along with CO, have overall environmental impacts, being greenhouse gases.

The quantities of pollutants emitted by the equipment depend, mainly, on the following factors:

- the production technology of the engine
- the power of the engine
- the fuel consumption per power unit
- the capacity of the equipment

- the age of the engine/ equipment

It is obvious the fact that the pollutant emissions decrease when the performance of the engine are advanced, the trend in the world being the manufacturing of engines with low consumption per power unit and with a restrictive control of the emissions. These two elements are reflected by the dynamic of the EU legislation and the US legislation in the field.

The sources of pollutant emission specific to the objective are ground sources or sources close to the ground (effective emission heights of maximum 4 m from the ground level), open (the ones that imply the handling of ballast) and mobile.

The characteristics of the sources and the geometry of the objective place the location, in the category of the linear sources

It is mentioned that the pollutant emissions corresponding to the activities pertaining to the work are alternate.

Determining the flows of pollutants evacuated in the air during the execution of the construction works of the platform was made with the following methodologies:

- US EPA/AP-42/1998 methodology for the particles emitted by the handling of the materials, disturbances of the surfaces and the wind erosion;
- EEA/EMEP/CORINAIR-1997 methodology elaborated by the European Environment Agency for the pollutants emitted by the equipment.

The emissions of pollutants emitted by the road traffic will be presented in section 2.2.2.2.

It is mentioned that one cannot associate to the activities in the location concentrations in emission, being free, open sources. From the same reason, they cannot be assessed in relation with the provisions of order 462/93 and with other regulations regarding the emissions.

In order to determine the pollutant emissions in the area where the works are going to be developed, the following elements were taken into consideration:

- the category of works that are to be executed
- the quantities of materials handled according to the category of works
- the intensity of the works
- the type of equipment

- the number of vehicles and equipment
- the capacity and fuel consumption, according to the type of the equipment
- duration of works/ functioning period.

The data base used to determine the pollutant emissions in the atmosphere is presented below.

Sources of air pollution

Excavated material (ballast) – 300000 m^3 in approximately 300 days= 1000 m^3 /day, respective 100 m^3/h.

Necessary $\frac{100\ m^3/h}{36\ m^3/h}$ = 2.77 Nabor excavators

2.77* 120HP * 0.2l/h= 66,48l/h diesel fuel

Fillings – m3 in approximately 300 days= 1000 m3/day, respective approximately 100 m^3/h.

A complex installation of approximately 200 HP which can ensure this work rhythm is necessary.

1* 200* 0,2 = 40 l/h diesel fuel

Thus, at the peak of the execution, the equipment that will enter the work site will be able to use: 66,48 + 40 = 106,48 l/h diesel fuel

The pollutants emissions have a duration equal to the daily work schedule (mainly 10 hours a day) but it can have variations from hour to hour or from day to day. At the same time, taking into consideration the fact that the annual duration of the works is 7-9 months/ year (spring+ summer + autumn). In winter the emissions stop. In the annual work period there will also be present variations of the emissions, both due to the category of activities that will be executed and due to the variations of the weather.

The emissions of particles generated by the wind erosion can happen continuously, during the entire construction period, the flows varying significantly with the speed of the wind.

It is mentioned that, in order to avoid the underestimation of the situation, the following were taken into consideration:

- the maximum intensity of the works
- the conditions that favour the highest emissions (the simultaneous development of certain works, maximum particle content with small diameters, under 75 μm in the handled materials, the minimum humidity of the soil and ballast, etc.)
- the engagement of the particles through wind erosion both on the disturbed surfaces and the piles of soil
- the use of classical equipment with diesel engines that do not have an emission control system (which are common on the work sites in Romania: bulldozers, excavators, scrapers, tractors, etc.).

It is specified the fact that the particle emission during the soil handling works are directly proportional with the content of small particles (d < 75 μm), inversely proportional with the humidity of the soil/ land and, as appropriate, with the speed and weight of the equipment.

Determining the flows of particles emitted in the air was performed according to the dimensional spectrum specific to the particles emitted and the material involved for each activity/ source. The flows of particles specific to the mentioned activities/ sources that were determined for the following equivalent diameters (d) of the particles:

- particles with d ≤ 30 μm;
- particles with d ≤ 15 μm;
- particles with d ≤ 10 μm;
- particles with d ≤ 2.5 μm; (particles that enter the bronchia and the lungs, the so called ”breathable” particles).

The particles resulted from the exhaust gas from the equipment fall, mist of them, under the category of breathable particles) The particles with diameters ≤ 15 μm are in the air as particles in suspension. The ones with big diameters rapidly fall on the ground.

The results regarding the flows of pollutants are presented in the following tables:

Mass flows of particles emitted in the air during the construction works

Emissions on the length and time unit –

Category of work / activity	**Mass flows for the dimensional spectrum (kg.m/h)**			
	d ~ 30 tm	**d ~ 15 tm**	**d ~ 10 tm**	**d ~ 2,5 tm**
Excavation	4.8857	1.1142	0.857	0.5142
Loading	0.3857	0.1285	0.0857	0.0085
Unloading	1.1571	0.3428	0.3	0.0428
Spread	31.0714	7.1142	5.3142	3.2571
Compaction	0.4714	0.1285	0.0857	0.0428
Scarfication	0.4285	0.0857	0.0857	0.4285
EROSION	1.3285	0.9	0.6857	0.0171
TOTAL	43.5857	9.8142	7.4142	3.9257

Mass flows of particles emitted in the air during the construction works

- **Total emissions on the surface and the execution period** –

Mass flows according to the dimensional spectrum (t/ execution period for the Category of work)				
	d ~ 30 tm	**d ~ 15 tm**	**d ~ 10 tm**	**d ~ 2,5 tm**
DIGGINGS	19.5	4.5857	3.4714	1.9285
FILLINGS	122.5714	28.37	21.4285	12.5142
TOTAL	142071.429	32.9571	24.9	14.4428
EROSION	4.9285	3.3428	2.5285	0.0857
TOTAL	147	36.3	27.4285	14.5285

The total values in tables regarding the particle emissions represent the maximum hourly mass flows which would be present, hypothetically, if the entire range of works would be performed simultaneously, a very unlikely situation.

Mass flows of pollutants emitted in the air during the consolidation works

- **Maximum hourly mass flows** –

Maximum hourly mass flows (g/h)							
NO_x	CH_4	COV_{nm}	CO	NH_3	N_2O	Part.	SO_2
112885	394.28	16380	36548.5	16.2	3008.57	13.242	23100
$Cdx10^{-3}$	$Cu\ x10^{-3}$	$Cr\ x10^{-3}$	$Ni\ x10^{-3}$	$Se\ x10^{-3}$	$Znx10^{-3}$	$HAPx10^{-3}$	
23.1428	3934.28	115.7	162.85	23.14	2314	7680	

- **Total mass flows –**

Total mass flows (kg/ execution period)							
NO_x	CH_4	COV_{nm}	CO	NH_3	N_2O	Part.	SO_2
31371	111.43	4551.4	10157.1	0.4714	835.71	3685	6428
$Cdx10^{-3}$	$Cu\ x10^{-3}$	$Cr\ x10^{-3}$	$Ni\ x10^{-3}$	$Se\ x10^{-3}$	$Znx10^{-3}$	$HAPx10^{-3}$	
6.42	1092.85	32.14	47.14	6.43	643	2134.28	

The total values in the tables regarding the pollutant emissions generated by the equipment represent the hypothetical situation where the entire equipment would work simultaneously in order to perform all the necessary activities, in the estimated period of time. The maximum hourly values represent the peaks of the possible emissions specific to the functioning of a set of equipment.

2.2.2.2. Work vehicle traffic

The flows of pollutants generated by the traffic have been determined by means of EEA/ EMEP/ CORINAIR- 1997 methodology (for the pollutants emitted by the vehicles) and by means of methodology US EPA/ AP- 42/ 1998 for the particles emitted in the traffic ways (considered unpaved or covered in dust, during the periods without precipitation).

The emissions were calculated by taking into consideration the details presented in section 2.2.2.1.

The inventory of the emissions for the work traffic represents a maximization of the situation because, beside the conditions of the road infrastructure,

there were also taken into consideration the vehicle equipped with diesel engines that do not have systems to control the emissions.

The results are presented in the following table:

The emissions of pollutants in the atmosphere - Work vehicle traffic (execution period)

Maximum hourly mass flows

Maximum hourly mass flows (g/h)						
NO_x	CH_4	COV_{nm}	CO	N_2O	Part.	SO_2
10542,8	60	2014	8443	30	255253	2468
$Cdx10^{-3}$	$Cu\ x10^{-3}$	$Cr\ x10^{-3}$	$Ni\ x10^{-3}$	$Se\ x10^{-3}$	$Znx10^{-3}$	
2,48	420	12,34	17,27	2,48	248	

Total mass flows (in the location and the rest of the structure)

Total mass flows (kg/ execution period)						
NO_x	CH_4	COV_{nm}	CO	N_2O	Part.	SO_2
48120	283	9197	38541	137	42776	11271
$Cdx10^{-3}$	$Cu\ x10^{-3}$	$Cr\ x10^{-3}$	$Ni\ x10^{-3}$	$Se\ x10^{-3}$	$Znx10^{-3}$	
11,27	1916	55,7	77	11,27	1127	

The sources of pollution of the atmosphere associated to the activities that will take place in the location are free, open sources disseminated on the and surface where the construction works take place, having other particularities than the sources pertaining to some industrial activities or other similar activities. As a result, an installation of treating -evacuating in the atmosphere the impure air/ residual gas is not an aspect that was taken into consideration.

Details of the type of pollutants and the negative effects on the environment and health were studied in chapter I, sub-chapter 6.3.

2.2.3 Operating period

During the operating period, the pollution sources will be represented by: - The technological furnace for the heating of the thermal fluid, that functions on methane and process gas;

- Technological boiler, functioning on methane;
- two autonomous heating system to heat the work spaces, functioning on methane;
- Flare, it has a continuous functioning pilot on methane;

2.3. Forecasting the impact of air pollution

2.3.1. Current situation

There is no impact in the air.

2.3.2 Construction time

2.3.2.1. Regulations

The regulations in force do not mention standards for the emissions for free, sources. Regarding the mobile sources, there are regulations for the emissions from road vehicles, and it is the responsibility of the owner of the vehicles that will be involved in the road work traffic to follow them.

The assessment of the impact of the sources pertaining to the consolidation activities was made through mathematical shaping, the results being connected to the maximum concentration values (CMA) referred to in:

- The national standard for the quality of air (STAS 12574-87)
- The EU standards for the quality of air
- The values – for guiding the quality of air recommended by the World Health Organisation (WHS)
- The values – recommended by the International Union of the Organisations for the Study of Forests (IUOSF) for the protection of the vegetation

Next, the CMA are presented and also the limit values (VL) and the guide – values foreseen/ recommended by the National standard and the internal organisations for the pollutants specific to the studied sources

CMA from STAS 12574-87

	30 minutes	**anually**
• SO_2:	750 µg/m^3	60 µg/m^3
• NO_2:	300 µg/m^{3m}	40 µg/m^3
• CO:	6000 µg/m^3	-
• particles:	500 µg/m^{3m}	75 µg/m^3
• NH_3:	300 µg/m^3	-
• Cd:	0.06 µg/m^3 (calculated from $CMA_{24}h$)	-
• Cr^{6+}:	4,5 µg/m^3 (calculated from CMA_{24}/h)	-
• Pb:	3 µg/m^3 (calculated from CMA $_{24}$/h)	-
• substances with synergistic action: C_1/CMA_1 + ...+ Ci/CMA_I < 1		-
• formaldehyde	35.	-

STAS does not have CMA for the other heavy metals that are emitted and for HAP

The limit values stated in the EU Directives

NO_x VL = 200 µg/m^3 for t ≤ 1 hour

VG = 135 µg/m^3 for t ≤ 1 hour

The above values represent the concentrations associated to the 98th percentile.

VL = 40 µg/m^3 for t = 1 year – proposed

VG = 30 µg/m^3 for t = 1 year – for the protection of the ecosystems in the areas where there are not buildings

CO VL = 10.000 µg/m^3 for t=8 hours

SO_2 VL = 80-120 □g/m^3 the average daily values measured for a year, associated with the average daily values measured for a year for particles: > 40 µg/m^3 and respective, ≤ 40 µg/m^3

VG = 100 µg/m^3 for t ≤ 24 hour

VG = 40-60 µg/m^3 for t = 1 year

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

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

VL= 125 . μg/m^3 for t= 24 hours

VL = 20 μg/m^3 for t = 1 year – for the protection of the ecosystems

VL= 10-15 μg/m^3 for t= 1 year in areas with devices, etc. that are sensitive to SO_2

Pb 0,5 μg/m^3 for t = 1 year

Particles in suspension

VL = 80 μg/m^3 the average daily values measured for a year (gravimetric) total

VL = 250 μg/m^3 - the value of the 98th percentile for daily strings of values with t ≤ 1 hour

VG = 40-60 μg/m^{3}for t = 1 year

VL= 100-150 μg/m^3 for t= 24 hours

Particles in suspension with Φ ≤ 10 μg

VL= 50 μg/m^3 for t= 24 hours

VL= 40 μg/m^3 for t= 1 hour and 20 μg/m^3 in year 2010

Particles in suspension with Φ ≤ 2,5 μg

VL= 50 μg/m^3 for t= 30 minutes - proposed

VL= 20 μg/m^3 for t= 24 hours in year 2010- proposed

VL- current limit value

VG - guide-value

Values – recommended by the WHO

Cd - potentially cancerous tolerable at an average medium concentration of 0,005 μg/m^3. Cr - for the exposure during the entire life time at an average concentration of 1 μg/m^3 the risk of cancer is 4 $*10^{-2}$;

HAP (as benzaprine) - for the exposure during the entire life time at an average concentration of 0,001 μg/m^3 the risk of cancer is 8,7* 10^{-5};

Ni- for the exposure during the entire life time at an average concentration of 1 μg/m^3 the risk of cancer is 3,8 . 10^{-4};

Pb - 0,5 μg/m^3 as annual average;

CO - 60.000 μg/m^3 for t = 30 minutes. and 10.000 μg/m^3 for t = 8 hours;

NO_2 - 400 μg/m^3 for t ≤ 1 h, 150 μg/m^3 for t = 24 h

formaldehyde 100. - μg/m^3 for t = 30 minutes.

Values – recommended by IUFRO for the protection of vegetation

NO_2 - 95 μg/ m3for an exposure of 4 hours, 30 μg/ m^3as annual average in in the presence of ≤ 30 μg/m^3 $SO_2$and of ≤ 60 μg/m^3 O_3 - protection of the ecosystems;

SO_2 - 150 μg/ $m^3$for an exposure of 1 hour, 30 μg/m^3 as an annual average in in the presence of ≤ 30 μg/m^3 $SO_2$and of ≤ 60 μg/$m^3$$O_3$ -protection of the ecosystems;

2.3.2.2. Pollutant dispersion in the air

The beneficiary requested a study for the dispersion of the pollutants in the atmosphere, study made by SC Global Innovation Solution SRL.

In the dispersion study, the following elements were taken into consideration:

- The fix and mobile sources of emission in the location;
- The fix and mobile sources of emission outside the location;
- The configuration of the land in the impact area
- The relief factors;
- The dynamic of the air currents
- The climate of the area.

In order to simulate the dispersion of pollutants, the model METI-LIS 2.03 was used; it was elaborated by the Ministry of Economy, Commerce and Industry in Japan. This is a gaussian tip contaminant plume that uses the following entry data:

- the analysed pollutants;

- the functioning regime;

- weather data: direction and speed of wind, air temperature, atmospheric stability class. For the simulations having large mediation time, the stability class is determined based on the solar radiation, the speed of wind and turbidity;

- data regarding the configuration of the land. Implicitly, the program takes into consideration a flat land, but allows entering data regarding the configuration of the land by the user in matrix format.

In the dispersion study, the following situations have been analysed:

- The dispersion of the air pollutants from the activities that are to be developed in the location of the Plant for the refining of waste oils in order to determine the contribution of the activities developed on the level of air pollution in the impact area.

- The dispersion of the air pollutants from the activities developed in Oltenița, in order to estimate the actual level of pollution in the impact area (external sources);

- The dispersion of the air pollutants from the location of the Plant for the refining of waste oils and from external sources, in order to determine the accumulated impact.

The following directed emissions sources have been identified:

- The technological furnace for the heating of the thermal fluid, functioning with methane gas and process gas;

- Technological boiler, functioning on methane;

- two autonomous heating system to heat the work spaces, functioning on methane;

- Flare, it has a continuous functioning pilot on methane; Shaping the dispersion of the pollutants was made for the normal functioning of the installation, situation in which process gas is not sent to the flare.

Beside the directed emission sources, in the study the following mobile sources have also been taken into consideration: road traffic in the location.

At the proposal of Global Innovation Solution, the Beneficiary designed the implementation of a treatment system for the gas resulted from the thermal fluid heating system (furnace) with humid scrubber which ensures a minimum guaranteed treatment power

of 95%, so that the calculated flow of SO2 is 3,050 kg/h.

The power of the pilot burner from the flare was calculated taking into consideration a consumption of methane of 6 Nmc/h, having a higher heating value of 8500 kcal/Nmc. In order to shape the dispersion of the gas from the two heating systems, the parameters that lead to an increase of the contaminant plume (height, peak diameter, temperature, gas speed at evacuation) have not been taken into consideration. The temperature and ascendant speed of the gas at flare is based on estimation.

To estimate the actual state by shaping the dispersion of the pollutants of the quality of the air in the area of Oltenița Municipality, the following categories of emission sources have been taken into consideration

- The pollutants emissions from economical activities: the technological processes and the storage, the internal road traffic in the locations of the economical operators from the neighbouring activities;
-Polluant emissions from residential activities- preparing and heating food, heating up the houses and commercial and office space.
- Emissions from the road traffic

The results of the shaping determination of the dispersion of the pollutants from internal sources

After the analysis of the results of the dispersion determination of SO2, it resulted that the dispersion is significantly influenced both by the weather (wind speed, air temperature and stability class) as well as the relief conditions. In the case of the SO2 dispersion for a mediation time of 60 minutes, there have not been registered an exceeding of the limit value for any of the analysed scenarios. The highest values of the concentrations of SO2 in the air have been registered for mediation time of 60 min., in specific situation of atmospheric stability during night time (stability class F), for the direction of the wind NNE (61,32 µg/mc) and N (83,60 µg/mc) much below the limit value for a mediation time of 350 µg/mc. This fact is due to the difference of level between the location and the locality (approximately 18 m.)

Tutrakan (80 – 123 m) As a consequence, it resulted the functioning of the installations in the location of the Plant for the recycling of waste oil is not susceptible to provoke a significant pollution with sulphur oxides in Tutrakan locality.

Following the shaping of the dispersion of pollutants resulted from the functioning of the installations in the location of the Plant for the recycling of waste oils us not susceptible to provoke a significant pollution with sulphur oxides in Tutrakan locality.

After the analysis of the results of the dispersion determination of NOx, it resulted that the dispersion is significantly influenced both by the weather (wind speed, air temperature and stability class) as well as the relief conditions. In case of the dispersion of NOx for a mediation time of 60 minutes, there has not been recorded an exceeding of the limit value of 200 μg/mc for any of the analysed scenarios, even in the worst climate conditions for dispersion. Thus, in the worst situation (wind SSV towards Oltenița, stability class F), maximum concentration reaches a value of 42.7 μg/mc in the immediate proximity of the location.

After the analysis of the results of the dispersion determination of NOx, it resulted from the emission sources in the location of Green Oil and Lubes S.R.L. – "Waste Oil Recycling Plant, Oltenita results that there will be no record of a NOx pollution phenomenon as a result of the activities developed in the location.

After the analysis of the results of the dispersion shaping determination of CO it resulted, for all 9 scenarios that were investigated, that the maximum permitted values of the CO concentrations in the air is situated at 3-4 size orders under the value of 10 mg/cubic meter As a result, it is estimated that the CO pollution resulted from the activities developed in the location of the waste oil recycling plant will have an insignificant level.

Following the analysis of the results of the determination of the dispersion shaping of the PM10 powders it resulted that, for all the 4 investigate scenarios, the maximum permitted values of the concentrations of the powders in the air are situated at 3-4 size orders under the limit value of 50 μg/cm for a mediation time of 24 ore, respective 40 μg/cm for an annual mediation time. As a result, it is estimated that the pollution with powders resulted from the activities developed in the location of the waste oil recycling plant will have an insignificant level.

The results of the shaping determination of the dispersion of the pollutants from external sources

After the analysis of the results of the dispersion determination of SO2, from external sources it resulted that the dispersion does not have a significant pollution potential with sulphur oxides, regardless of the atmospheric conditions or the mediation period.

After the analysis of the results of the dispersion determination of NOx, it resulted that the dispersion is significantly influenced both by the weather (wind speed, air temperature and stability class). In the case of the dispersion of NOx for a mediation time of 60 minutes, in conditions of atmospheric stability, there is the possibility to exceed the limit value of 200 µg/mc at a local level in the inhabited area of Oltenița, around the source of emission, without having a significant impact on the neighbouring areas.

As a result of the dispersion determination of NOx it resulted from the external sources that there can be local NO pollution phenomena as a consequence of the function of domestic consumers, without having a major impact.

After the analysis of the results of the dispersion shaping determination of CO it resulted, for all 9 scenarios that were investigated, that the maximum permitted values of the CO concentrations in the air is situated at 4-5 size orders under the value of 10 mg/cubic meter As a consequence, it is estimated that the CO pollution resulted from the residential activities is situated at an insignificant level.

Following the analysis of the results of the determination of the dispersion shaping of the PM10 powders it resulted that, for all the 3 investigate scenarios, the maximum permitted values of the concentrations of the powders in the air are situated at 3-4 size orders under the limit value of 50 µg/cm for a mediation time of 24 ore, respective 40 µg/cm for an annual mediation time. As a consequence, it is estimated that the powder pollution resulted from the residential activities will be situated at an insignificant level.

The results of the shaping determinations of the dispersion of the pollutants– cumulated impact.

Following the analysis of the results of the determination of the SO2 dispersion from the sources that are in the location and the external sources it resulted that these sources do not

present a significant sulphur oxide pollution potential, regardless of the atmospheric conditions or the mediation time.

After the analysis of the results of the dispersion determination of NOx, in the context of the cumulated impact, it resulted that the dispersion is significantly influenced both by the weather (wind speed, air temperature and stability class). In the case of the dispersion of NOx for a mediation time of 60 minutes, in conditions of atmospheric stability, there is the possibility to exceed the limit value of 200 µg/mc at a local level in the inhabited area of Oltenița, around the residential source of emission, without having a significant impact on the neighbouring areas.

Following the analysis of the results of the NOx dispersion determination resulted from internal and external sources it results that there can be local NO pollution phenomena. By comparison with the similar data it results that the activities developed in the Location of the waste oil recycling plant have an insignificant contribution to the level of NO in the air in Oltenița municipality.

After the analysis of the results of the dispersion shaping determination of CO it resulted, for all 9 scenarios that were investigated, that the maximum permitted values of the CO concentrations in the air is situated at 4-5 size orders under the value of 10 mg/cubic meter As a result, it is estimated that the CO pollution resulted from the activities in the location and the residential activities is situated at an insignificant level.

Following the analysis of the results of the determination of the dispersion shaping of the PM10 powders it resulted that, for all the 3 investigate scenarios, the maximum permitted values of the concentrations of the powders in the air are situated at 3-4 size orders under the limit value of 50 µg/cm for a mediation time of 24 ore, respective 40 µg/cm for an annual mediation time. As a result, it is estimated that the pollution with powders resulted from the activities developed in the location and from the residential one will be at an insignificant level.

After the analysis of the results of the dispersion determination of the pollutants resulted from the activities performed in the location of Green Oil and Lubes S.R.L. – "Waste Oil Recycling Plant, in the context of cumulated impact, it resulted that the activities that are to be developed in the location will have an insignificant impact on the air.

2.4. The cross-border impact

2.4.1. Current situation

There is no cross-border impact.

2.4.2. Construction time

Not necessary

2.4.3. Functioning period

According to the provisions of annex no. 1 of law 22/2001 for the ratification of the Convention regarding the assessment of the impact on the environment in a cross-border context, adopted at ESPOO on February 25th 1991 corroborated with the fact that the proposed investment is close to the border of Romania with Bulgaria, the investment that is developed falls within article 6 ”Integrated Chemical Installations”.

The location of the investment is at a distance of 1000 m towards the border.

The unit performed a Pollutant dispersion study in the atmosphere to establish the degree of the cross-border impact.

After the analysis of the results of the dispersion determination of the pollutants resulted from the activities performed in the location of Green Oil and Lubes S.R.L. – "Waste Oil Recycling Plant, in the context of cumulated impact, it resulted that the activities that are to be developed in the location will have an insignificant impact on the air.

2.5 Measures to diminish the impact

2.5.1. Current situation

There aren't necessary any measures to diminish the impact.

2.5.2. Construction time

In order to reduce the possible impact on the air, the following measures are necessary:

- covering the raw materials and materials warehouses to reduce the action of the wind
- periodical technical checks of the machines
- using new machines and trucks that have efficient systems of minimizing and retaining pollutants in the atmosphere

- periodically water of roads that are used by the construction machines, especially during the hot season.
- using liquid fuels for the machines and trucks which meet the latest regulations

For the pollution emission sources identified in the present study, in this stage, it is considered that it is not necessary to have special installations to treat residual gas and to retain powders or collecting and dispersion installations.

To reduce the pollution from the exhaust gas of the vehicles that will access the objective, there are legal provisions specific to this field and competent specialised bodies to control and monitor them.

2.5.3. Functioning period

At the proposal of Global Innovation Solution, the Beneficiary designed the implementation of a treatment system for the gas resulted from the thermal fluid heating system (furnace) with humid scrubber which ensures a minimum guaranteed treatment power of 95%, so that the flow of SO2 taken into consideration is 3,050 kg/h.

Preliminary quantity of generated solid will be approximately 810 kg/hr.

Sr.No.	Name of salt	% of Total Solid
1	Nacl	80.666
2	NaHCO3	0.160
3	MgSO4	0.172
4	Ca(HCO3)2	0.350
5	Na2CO3	0.052
6	NaF	0.022
7	Na3PO4	0.027
8	Na2SO4	7.773
9	Water	10.778

3. The soil

3.1. Soil pollution sources 3.1.1.

Dominant soil characteristics

The weather and relief conditions and the material have determined the types and sub-types of soil specific to the region. Currently, this soil falls under the category of red luvisols and respective aluvisols.

The aluvisols have different textures, according to the texture of the alluvial materials that are deposited and which in connection with the frequency and duration of the flooding have different stages of evolution towards the normal soil type. The profile of the soil is type: Am-A/C-C.

Am, having a thickness of 24 cm, is dark brown, relatively rich in humus (4,75%), with a small polyedric glomerular structure and clay-sandy texture.

A/C has a thickness of approximately 20-25 cm, e reduced humus content (2,55%), has a brown-yellow colour with brown spots, clay-like texture and it has no structure.

C, consisting of a layer of alluvial sediments has a thickness of 70 cm, with a clay-like texture and a reduced humus content (0,69 %). The colour is brown-yellow.

At the base of the profile there is a R/Cca horizon, consisting of sands and gravel with red spots.

The alluvial mollic soil does not have carbon and the saturation degree is greater than 80%.

The content of mineral and organic nutrients vary between the following limits:

- total humus 0,66 - 4,75 %;
- total nitrogen 0,037 - 0,270 %;
- mobile phosphorus 5,72 - 27,00 mg % g. soil;
- assimilable potassium 6,70 - 46,74 mg % g. soil.

The soil sub-type is very rich in humus, total nitrogen, mobile phosphorus and assimilable potassium.

The typical alluvial soil is made on recent alluviation, with the underground water at a depth of 3 -5 m during the summer.

The profile of the soil is generally type Am-Ac-C.

The physiologic thickness is of 50-100 cm.

The texture is clay-sandy.

The brown red soil can be found on plains and it is formed on loess deposits.

The profile of the soil is type Ao-Bt-C or Cc with a black-brown Aom horizon, with glomerular structure, degraded, a transition A/B horizon

brown-black, with small sub-angular poliedric structure and a Bt horizon, brown-red to dark brown and medium sub-angular poliedric structure.

Typical brown-red soil is very deep (1,20 - 1,60 m) and it has a high edaphic volume.

The clay content is quite high 28,63 - 39,42 %. The humus content is between 2,84 - 4,96 % in the superior part of the horizon Aom, 1,32 - 1,90 % at its base and 0,44 - 1,32 in the Bt horizon. The saturation degree is between 88,8 - 95,76 %, this situating the soil in the eubasic soil.

The content of mineral and organic nutrients is between the following limits:

- total humus 0,44 - 4,96 %;
- total nitrogen 0,023 - 0,277 %;
- mobile phosphorus 7,53 - 35,26 mg % g. soil;
- assimilable potassium 24,76 - 52,63 mg % g. soil.

Due to the small quantity of precipitations, the capacity of the soil to have a water supply is quite small. The small quantities of water in the soil represent the only limiting factor for the vegetation.

From the point of view of the chemical characteristics the soil is alkaline. The soil is well supplied with nitrogen, potassium and phosphorous and due to the favourable humidity regime it is covered in vegetation.

3.1.3 The existing pollution

The general degradation of the habitat, observed especially in the last two decades represented the main cause for the disappearance of a great number of species and for the reduction of the populations of some species that were well re[resented so that, nowadays, in the lacustrine ecosystem there is a small number of species (especially vegetation), but with a great abundance of individuals.

The works to the hydrographic basin have caused important modifications in the hydrographic network in the area of Oltenita.

The degradation of forests due to the aridity of the climate and the lowering of the underground water;

The modification of the landscape and the degradation of the habitats in the gravel exploitation area in the valley of the rivers;

Scheming the streams and transforming them into ponds.

Intensive agriculture

Extension of the built-up areas and building in the protected areas

Introduction of new species, lines/ types.

3.2. Soil pollution sources, stationary and mobile, of the proposed economic activities

3.2.1. Construction time

During the execution of the works, the soil pollution sources are the following:

- linear sources, represented by the heavy goods traffic and the equipment.
- surface sources, represented by the functioning of the equipment in area of work.

3.2.2. Functioning period

The following soil pollution sources can be identified and they are generated by:

- the residue from the fuel combustion: hydrocarbons
- the residue from the technological process inadequately deposited in special locations
- waste: their defective collection leads to a possible soil pollution, not only in the analysed area but also in neighbouring areas due to the action of the wind.

3.3. Forecasting the impact of soil pollution3.3.1. Construction time

Relief that is currently forming, the analysed area has soil and sub-soil *still* unsettled, thus an additional load will lead to uneven settlements

of the sub-layer. During the construction time, on the roads and the access roads, the vehicles and the equipment will release particles loaded with heavy metals which will enter the soil. Thus, there is the possibility to contaminate the soil with Cd, Cu, Cr, Ni, Se, Zn.

The dust quantities released in the atmosphere during the development of the work will be insignificant. Performing the works does not involve important volumes of earthworks, handling big quantities of soil, aggregation, etc. The pollution will manifest itself on a limited period of time (during the construction works) and spatially on a small area.

Additionally, there is still the risk of accidental oil or fuel spills as a result of the some technical malfunctions of the equipment. Also, the inadequate storage of the materials and/ or the waste from the construction activities can become a source of pollution.

3.3.2. Functioning period

If the waste are stored accordingly in the location, there will be no significant impact on the environment.

3.4. The cross-border impact

3.4.1. Construction time

Not necessary

3.4.2 Functioning period

Not necessary

3.5 Measures to diminish the impact

3.5.1. Construction time

To reduce the impact on the soil, the following measures are necessary:

- complex geo-technical studies that indicate the maximum carrying capacity of the land

- the work will be made in stages allowing a corresponding settlement of the sub-layer
- periodical checks (topographical and geodetic measurements) of the platform settlement,
- covering the raw materials and materials warehouses to reduce the action of the wind
- finding locations for the storage of the construction materials. that affects the soil as little as possible
- ensuring security in the storage areas.
- periodical technical checks of the machines
- using new machines and trucks that have efficient systems of minimizing and retaining pollutants in the atmosphere
- periodically water the roads that are used by the construction machines, especially during the hot season.
- using liquid fuels for the machines and trucks which meet the latest regulations

3.5.2. Functioning period

We recommend some organisational measures for the corresponding maintenance of the soil and sub-soil, respective Eliminating by capitalizing the used parts resulted from the activity

Eliminating any type of waste that could affect the quality of the soil;

The proper maintenance of the access roads

By following the waste regime, including the rhythmical elimination and the adequate storage of the waste, it is considered that it will have no significant negative impact on the environment and the soil.

Both during the execution period and the functioning period, the unit will be equipped with a platform for the containers for the temporary and selective storage of the waste– waste that will collected and unloaded at the authorized warehouses by means of a service contract or recycled, as appropriate.

4. Biodiversity

4.1. The predicted impact

Current situation

The special bird area protection ROSPA0038 Danube -Oltenita – hereinafter named Site ROSPA0038 Danube - Oltenita– is a natural protected area of community interest - the category of area of special protection according to Directive 2009/147/CE of the European Parliament and the Council of 2009 regarding the conservation of wild birds set by the Government Decision no. 1284/2007, declaring the special bird areas as an integral part of the European ecological network Nature 2000 in Romania, amended and supplemented by Government Decision no. 971/2011.

The Site ROSPA0038 Danube - Oltenita falls under category IV of management, areas for the management of the species and habitats.

The Site ROSPA0038 Danube is owned by custody by The Bio Association Romania since May 2016. Also, a Management Plan was elaborated for this site.

The conservation status of the site is good, by comparison with the moment of the designation of Nature site 2000, threats on the site are represented by the inclusion in the site of many human communities and the lack of treatment of the wastewater. Another possible future modification is abandoning the traditional practices of durable and traditional use of the land.

The habitats present in the site fall under the standard form Nature 2000 in stage C of conservation.

Taking into consideration the conservation degree and the functions of the type of habitat as well as the recovery possibilities it can be considered that in the studied area the site has its structure medium or partially degraded, but with good or excellent perspectives and easy restoration or possible with medium efforts.

4.1.2. Construction time

The studied location, according to Order no. 776/2007 is near the European ecologic network Nature 2000, 7 m from the site RO SPA 0038 – Dunare - Oltenita, site of community importance.

On the location there are no habitats of community interest. The characteristic habitat is the land for agriculture.

Observations in the field were made over a period of almost 2 years. There were made field charts regarding the particularities of the studied species according to the time period when the monitoring was made, so that they contain all the life stages of the individuals and the way of interaction with the studied area. Monthly centralizing tables were made with the observed species, thus observing the dynamic of the populations and the dispersion of the individuals in the area. . These observations show the fact that in the studied area there was no record of bird species that lay eggs or resident. The community interest species were observed only transiting the respective area. From this reason we can say that during this period of time the numerical evolution of the species was the same and by implementing the projects the species existing in the site will not be affected.

The impact will manifest itself due to the scrapping works for the constructions of the foundations, installations and access roads, of the dust resulted from the construction works and due to the noise made by the equipment, but they will have a short duration and they will not affect the protected species in the Site.

4.1.3. Functioning period

From the point of view of the Site Nature 2000, the location of the project is not the surface of the site and also there aren't any species of birds that lay eggs in the location. The majority of the protected species that were observed while monitoring the area were species that only were in transit. The number of the bird population is small due to the unfriendly conditions of the territory which is strongly anthropized.

During the operating period, the impact on the environment will be insignificant because the unit will have a closed circuit and it will not spill wastewater in the natural environment and it will not release emissions in the air, these being captured by the exhaust systems equipped with high end filters.

The impact of the operating stage on the integrity of the site Nature 2000 is insignificant due to the fact that there isn't a loss of the habitats of interest, there is no fragmentation of the habitats, there is no loss of surfaces of the habitats used for food, rest and reproduction of the species of community interest.

The impact of the operating stage on the conservation of the species of community interest for which the nature 2000 site was declared is insignificant.
The cumulated impact on the conservation of the species of community interest in the site Nature 2000 is insignificant.

The impact of pollutant emissions on the environment and especially on species of community interest is reduced due to the use of high-end technology, by installing advanced filters, by re-circulating the technological water, by installing wastewater pre-treatment facilities.

Also, the monitoring of the bird species during the entire development of the projects and after its execution to see if there are changes in the dynamic of the populations and their numerical evolution.

In the previous Zonal Urban Plan, a Study for an Adequate Assessment was made and it concluded that the impact on the bio-diversity is insignificant.

Also, the project has the approval of the custodian of Bio Association Romania.

4.2 Measures to diminish the impact

4.2.1. Construction time

In order to reduce the impact on affected habitats and species, adequate planning of construction works will be made to avoid or reduce species disturbance or the destruction of their nests and shelters

If there are construction works that require the removal of shrub formations or parts covered with grass or vegetation specific to the area, these will be taken and preserved under conditions similar to those in which they have developed outside the temporally affected area and when they are completed, they will be replanted in the remaining or outlying areas, where the habitat is not affected.

Machines to reduce the impact that were established in the design stage

In this stage, the measures with an important effect to reduce the impact on the protected areas are:

– The locations were chosen on land:
  – Free of construction to avoid demolition;
  – Without forests to avoid land clearing as much as possible;
  – Without the need for additional clearing services, pipe installations that would require construction works with impact on the habitat.
– Other measures that were established in the design stage to reduce the impact on the protected area:
  – Access in the location is direct to reduce the length of the interior roads and the habitat surfaces occupied by works;
  – The access roads are straight to cover smaller surfaces of land;
  – The access road territory has a minimum width and its structure can be easily removed during the demolition/ clearing stage of the works.

Measures to reduce the impact on the habitat and on the species of community interest for the construction period They are corrective and organisational measures.

– The work site/ production base will be set up outside the protected area to reduce the impact on the habitat.
– The accommodation of the workers will be made at the work site, it is recommended to be places outside the protected area.
– The utilities at the work site are ensured without additional works, respective
  – Water supply is ensured from the cistern and bottled water;

– Each work point will be equipped with mobile ecologic toilets.
– The work site will be marked with reflecting strips and strictly delimited to avoid reaching the neighbourhood areas.
– The constructor that has high-end, silent and small dimensions equipment will be preferred.
– The works on the access road platforms, the excavations for foundations and the development of technological platforms will be done taking into account the nesting period, reference breeding in the cold season when the migratory birds left.

At the end of the construction works, there will be works to recreate the habitat in the areas temporarily occupied by the implementation of the plan, respective the technological platforms and the surfaces established in the plan.

4.2.2. Functioning period

– The interdiction for the circulation of unauthorized vehicles on the interior roads, measure necessary to protect the habitat and the community interest species, but also to avoid the vandalisation of the plant.
– Performing professional performance work with immediate removal by capitalizing used parts or equipment.
– Reduced and more controlled interventions to preserve the habitat conservation status and not disturb the species of interest in the area.
– Monitoring the impact on the habitat and the species in order to establish the need for additional measures for the habitat conservation and protection.

5. Social and economic environment

5.1. The potential impact of the activity on the local demographic conditions and on the living conditions

7.1.1. Current situation

Currently, in Romania, there are no waste – oil recycling installations - plants - – on such a scale compared to the investment proposed by GREEN OIL AND LUBES SRL. In this sense, currently, a very small quantity of the waste oil generated is collected for recycling purposes, at national level in Romania. As a case study regarding the economic impact and the impact on the environment regarding waste management – , namely waste oils, the automobile repair shops will be taken into consideration as examples. In this sense, a very small quantity of waste oils is recycled by approved firms. Most of the waste resulted – waste oils are either discharged to sewage system or to the water courses, generating an extremely important negative impact on the environment, or are burnt in craft facilities, having also an impact on the environment in the context of exhaust emissions. In case an economic operator appears, who will pay for the purchase of the waste oil quantity, the automobile repair shop will be directly interested to adhere to this economic flow, from both an economic and risk incurred point of view regarding the management of the waste resulted.

7.1.2. Construction time

Once the works are started, new jobs will be created, fact that will generate a halt of the demographic decline of the locality. This will be done by stopping the emigration of the young population to cities with a favourable economic potential and it will offer them the possibility to make a name for themselves in their native place.

The investments that will be made will also create a better standard of living for the local population.

7.1.3. Functioning period

By launching this new created area, new jobs will appear. The young people will have a job, the emigration phenomenon will be stopped. In the future, the local community will find once again the social and economic identity and Oltenita will become a symbol of sustainable development.

8. Alternative analysis

Alternative "Zero" or "no action"

Alternative „zero” was taken into consideration as a reference element for the comparison with the other alternatives for the different elements of the Project.

The main forms of impact associated with the „zero” alternative are:

- losing important job opportunities;
- losing the investments made up until the present, having as result the loss of interest from the private investors, commercial banks and international financing institutions regarding the future industrial development projects in the region and in Romania;
- losing the support for the development of a modern installation, according to the regulations, which is in the field of the reduction of waste quantities at a national level - recycling the waste oil);

The most favourable situation for the area would be:

- to have solid economic opportunities and jobs;
- the impact on the environment and the social one generated by the activity that is to be developed and the other major economic development has to be at a minimum level;
- to have the technical capacities and resources necessary to remedy the occurrence of pollution.

To do this (and to prevent the negative social-economic impact generated by not implementing the projects) it is necessary to have a viable economic, capable to generate job opportunities and sufficient income to allow the resolution of the environment issues.

Below, you can find a comparison of the impact forms on the environment corresponding to „zero” alternative with the ones of the implementation of the project.

Alternatives:

The proposed option will lead to the following

advantages: the existing roads will be modernised;

new jobs will be created;

the extension of the city's water distribution network

creating a sewage system to direct the wastewater towards the treatment plant;

the power supply network will be developed to ensure a high degree of reliability and a good quality exploitation;

applying a modern and efficient system in waste management; introducing new systems for selection and selective collection of recyclable materials.

Regarding the present situation, the following have been taken into consideration:

Economic criteria (respective, efficiency). The proposed solution has the best results from the point of view of costs, smaller in comparison with other options; similarly, the maintenance costs are reduced.

Social criteria (respective social acceptability). The proposals have the best results from the point of view of the protection of the human factor; positive impact on the inhabitants is significant.

Environment criteria (respective the sustainability for the environment) The proposals have insignificant effects on the biodiversity, thing developed in the Study for the Adequate Assessment which was approved by APM Calarasi. It is true that at first glance, building a waste oil recycling plant in close proximity of Nature 200 site is an act of courage, but the environmental monitoring has shown that there are no priority habitats in the area, so no habitats are destroyed, the identified bird species are not resident on the site, they have been observed only in transit and most of the technological processes have a closed circuit. The investment also has benefits for the environment by creating a facility that will reduce the amount of waste oil used nationwide. A strict monitoring program will ensure the fact that there will be no significant or negative effects on the environment.

The work proposals satisfy the technical regulations on force. A different design option would not have had additional environment benefits.

The construction 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 constructor's technology. The technical solutions that will be further proposed will have to take into consideration:

- environment conditions,
- type and nature of works
- the possibility to use local materials,
- technical and functional utility and the security of the proposed development,
- facilities, functional, geological, hydro-geological, hydrological, and institutional characteristics of the area,
- the existing neighbours

The tender books will contain the recommendation for the constructor to use modern equipment that complies with the technical prescriptions, as well as with the European regulations in force in the field of the environment protection.

9. Monitoring

Economic and social development is a natural process from which an increase of the quality of life and of derive from when the project contains all the measures for integration into the environment.

According to Government Decision 1076/2004 the monitoring of the implementation of the project, based on the program proposed by the holder, proposes even from the very beginning the identification of its significant effects on the environment, as well as the unforeseen side effects with the purpose of taking the corresponding remedial actions. The performance of the monitoring program of the effects on the environment falls under the responsibility of the holder of the plan or program.

Thus, it is advisable to design the monitoring program of the emissions sources and the components of the environment that may be affected in three stages:

Stage I – Pre implementation plan – to establish the reference status of the environment;

Stage II– Starting the works – for the correction (remedy) of accidental polluting and for the **elimination of sources;**

Stage III – Post implementation plan – for the comparison of the status of the environment after the works are done with the initial reference status, in order to observe and control the new pollution sources to be able to rapidly act if necessary.

Taking into consideration the specific conditions, the main environment factors that are necessary to be monitored are:

The field of the significant effect	**Monitoring measures**
AIR	Monitoring the level of pollutants emissions both during the execution stage of the specific works and in the exploitation stage.
WASTEWATER	Monitoring the quality indicators of wastewater that are evacuated and setting them in the limits permitted by the Government Decision 188/2002, amended and supplemented by Government Decision no. 352/2005, respective NTPA 002/2002. Performing the pre-treatment installations
SURFACE WATER	Monitoring the quality indicators of the surface water and classification in quality classes Establishing areas for the protection of the river banks (according to the provisions of the authorities of The Romanian Waters Monitoring the quality of the soil and classification in the quality norms Monitoring the implementation of the selective collection of waste

SOIL	Monitoring the landscape set up in conformity with the provisions of the Zonal Planning
BIODIVERSITY	Monitoring the vegetation and biotope set up Monitoring the bird species during all periods of development
NATURAL RISKS	Monitoring the areas that have problems with their structure and keeping them
DEVELOPMENT OF THE ADMINISTRATIVE AREA	Creating an Initiative Committee to start the development programs Starting public– -private partnership projects or other forms of collaboration to obtain funds necessary for the development of the area Attracting funds from external financing programs. All investment works that will be related to water (adduction networks, drinking water supply sewage, treatment stations, river bank consolidation works) will need approvals based on the technical documentation drawn up according to the regulations in force. The implementation of each projects will be made by requesting the Environmental Agreements from the competent authority for environment protection.

The tables above represent the considerations of the elaborator based on the experience in the field showing the main environment factors considered necessary to be monitored. The main environmental factors considered necessary to be monitored, period of time, locations of the monitoring points, as well as the necessary parameters to be followed will be determined by the representatives of the Environmental Protection Agency.

10. Risk situations

10.1 Current situation

Currently, there are no risk situations.

10.2. Construction time

Different work accidents (specific to site activity) may arise due to inappropriate use of equipment and failure to comply with occupational safety standards. It is necessary to verify the technical condition of the equipment used in construction and in the implementation of the regulations in force in the field of employment protection.

10.3. Functioning period

In the functioning period, the risk factors will be represented especially by the pollutants emissions and the risk of flood. The risk is seen from the point of view the cross-border propagation in case of accidental pollution.

Regarding the emissions in the air, a Dispersion study was made, taking into consideration the internal pollution factors of the plant and the external pollution factors in the industrial area and the city area. All the options that can be taken into consideration have been presented regarding the pollutant emissions and the result of the study is that the investment has an insignificant impact both at a local level and at a cross-border level

Regarding the risk of flooding, the unit took into consideration through a hydrological study the flood limits of Arges River and the Danube.

The area where the tanks are located will be provided with a protection wall that allows the safe management of accidental leaks without reaching the exterior.

Also, it was proposed to lift the waste oil treatment plant and the storage tanks on the platform in order to get the land out of the floodable area so that it does not exceed the floodability limit of 1% measured in the studied area.

The measures included in the Plan for the management of flood risk will be followed:

○ Support for reaching and conservation of a good ecological status (SEB)/ a good ecological potential according to the requirements of D.C.A. Indicator> the number of the body of water subjected to the risk of not obtaining "the good ecological state" or "the good ecological potential" as effect of the hydro-morphological pressure (related to the measures of the flood risk);

○ Minimising the flood risk in the protected area to trap water intended for human consumption

Indicator: the number of water captation (intended for potable processes) subjected to the flood risk;

○ Minimising the flood risk in the objectives that have a polluting potential Indicator : the number of the areas covered by the IPPC Directive – IED (96/61/CE), Directive for Wastewater (92/271/EEC) and the Directive Seveso II (96/82/CE) subjected to the risk of flooding.

The measures established in Plan for the management of the hydrographic basin of the Danube area for the period 2016-2020 which has to be taken into consideration during the implementation and the functioning of the plant:

Measure code	Measure	Actions for the implementation of the measure	Action code
PM_2	The protection of the chemical state of underground water pollution and deterioration	2. Prohibiting activities that lead to the spill of dangerous substances in deep water	PM_2_2
GD_1	Prevention	2. Prohibiting or	GD_1_2

	substance spills in deep water	restricting activities that increase the risk of direct spills indirect spill of substances that are dangerous or other pollutants in the underground water, including bringing to the surface the underground water by extracting sediments and soil covering the body of water	c
PI_2	Ensuring an adequate treatment for the industrial wastewater	1. Prohibiting the functioning of the industry that produces waste and prohibiting the development of the activities without having the necessary treatment installations in conformity with the legal requirements, excepting the situations where this type of facilities are not necessary	PI_2_1
UW_2	Ensuring collection of the urban wastewater	3. The interdiction to include new users that eliminate wastewater in the sewage system of the localities, urban development where the collection and treatment is not possible	UW_2_3
DP_2	Reducing pollution from industrial activities	8. The interdiction to wash the vehicles and transport equipment in the floodable fields and in the residential area of the basins	DP_2_8

Regarding the Plan for the Management of the risk of flood in the region of the Danube for the period 2016-2020, it should be taken into consideration the fact that for the Danube region there is an area with a potential flood risk with the code BG1_APSFR_DU_001, the Danube having a length of 472 km, covering the localities between Novo Selo and Silistra.

Regarding the measures in the Plan, no bans and restrictions are provided for the investment proposal for which the Zonal Urban Plan

The area pertaining to the code BG1_APSFR_DU_001 is defined as having a high risk of floods based on the floods in 205 and 2006 which corresponds to the floods with an index of 1% in Bulgarian- Romanian eastern section.

It was agreed and accepted an international plan for Bulgaria and Romania together with the competent authorities

The big waters of the Danube can lead to the rise of the Iskar river and the Vit river downstream and create a risk for the surrounding landscape. This happened in 2005.

Piers were built in this area, at present they are in good condition.

According to the Annual Risk Report 2015, the critical areas of the protection piers are:

- Iskar - compromised stability of the left and right piers in Bulgaria
- Vit - compromised stability of the left pier of the soil - The Danube floods the shore.

As the plant will be built on a platform that exceeds the flood rate, there will be no major hazards in case of floods.

11.Description of difficulties

11.1 Construction time

During the construction time, the following difficulties can be identified:

- bad weather (strong winds, abundant rainfall, low or very high temperatures) that can extend the construction period
- unpredictable difficulties arising due to the geological conditions of the land on which it is being built
- technical failures of the equipment
- work accidents due to non-observance of labour protection measures

- delays in the supply of construction materials

11.2 Functioning period

During the operating period, difficulties can only arise in the case of failure of utility systems (water supply, power supply, wastewater evacuation).

The possible disasters that can appear during the functioning of the refinery and which can affect the Bulgarian party are the following:

- Danger of explosion
- Cracks in the storage tanks- Floods

The holder of the activity is obliged to:

take all necessary measures to prevent major accidents and to limit their consequences on the public health and on the environment;

inform the public authorities if an installation, a storage unit, the nature or quantity of dangerous substances existing in the location at that time is modified, modification which can have significant effects regarding the danger of major accidents;

provide for its own personnel and for the people who can be affected, if an accident occurs, accident generated by the objective, information on the security measures and on the necessary actions for the intervention

to immediately inform the local public authorities on the civil protection and the environment protection, in case of a major accident

The unit must make an Intervention plan in case of accidental pollution.

According to the Intervention Plan, in case of accidental pollution, in order to fight pollution, the following are established:

List of critical points in the unit where pollution may occur;

The data sheet of the potential pollutant;

The measures and activities to prevent accidental pollution;

The members of the committee for the settlement of emergency situations with the responsibilities of the leaders;

The composition of the team assigned to combat accidental pollution;

The list containing the equipment and materials necessary to stop accidental pollution;

The procedure regarding the record of the information regarding accidental pollution;

The warning procedure in case of accidental pollution.

The plan will be revised annually and updated if necessary.

In the unit, the plan must be made available for the control bodies at any time

Malfunction which can have major effects on the environment must be registered in written form. The following must emerge from the written records which have to be made available to the competent authority:

- Type, moment and duration of the malfunction,
- The quantity of the emitted toxic substances (if appropriate, an assessment is necessary),
- The consequences of the malfunction in the objective and outside the objective.
- All the initiated measures.

The malfunctions whose effects can spread on the entire surface of the objective or which are dangerous for the public health or life must be immediately communicated

- to the Directorate for Emergency Situations
- and to the authority responsible for the protection of the environment.

Regarding the danger of flooding the land, the unit will build on the platform the refining installation and the storage tanks in such manner that they will exceed the flooding limit.

12. Non-technical summary

The beneficiary of the investment - GREEN OIL AND LUBES SRL wants to build a facility to process waste oil with a capacity of 200 tpns/ day The development of this economic activity is extremely important also in the context of

the obligations assumed by ROMANIA regarding the waste management and recycling them according to the European directives.

The investment objective is located in the built-up area of Oltenita, Calarasi County. The address of the real estate is strip 89, plot A5774, patch 89. The area of the real estate concerned (the studied real estate) is 17,88 ha.

The location of the investment is 1000 meter away from the state line between Romania and Bulgaria.

The Danube river is 650 meter away from the site.

The Arges river is more than 300 meter away from the site.

From the altimeter point of view in the national quota system Black Sea 1975, the average quota of the land subject to the investment is approximately 16,5 meters.

Also, close to the land there is an archaeological site at a distance of 24 m.

The waste oil recycling plant will have a processing capacity of 200 tons / day, which implies, according to the technological flow presented by the beneficiary, an annual processing quantity of approximately 66.000 tons of oils. The technology will be a cutting-edge one, by combining the advanced distillation technology with the catalytic hydro-treatment under high pressure of the oil base recovered.

Overall, the plant will lead to the environment protection, by processing approximately 66.000t/year of hazardous and toxic waste, producing the base for the high quality lubricating oil.

1. Protecting the quality of the water

The water supply will be made from the public network of SC ECOAQUA SA CALARASI SUCURSALA OLTENITA by means of connecting pipes.

The water from the public system will be used:

- for hygienic purposes by the employees of the company
- technologically (steam preparation, cooling of the installation (water is recirculated)
- in the laboratory (the vessels will be washed)
- cleaning the area
- to ensure backup solution regarding fire protection – a fire tank is set up to supply the hydrant, if necessary.

The plant will use part of the technological processes, mainly demineralised water. The necessary steam is very small, mainly for the cleaning of the equipment, at stops. The void pumps do not need steam, as the conventional ejectors do, thus using the best technologies in the field.

The cooling needs will be ensured by a system of re-circulated water cooled in a cooling tower. Thus, possible oil leaks will not affect the ground water, being a closed circuit.

In the location the following categories of wastewater will be present

-from the cleaning the area
- from the laboratory (washing the recipients)
- from the gas stripping
-from the dehydration of the oil

The water that will be used in the plant, will pass through a softening/ demineralisation installation before use.

Wastewater together with the water resulted from the cleaning of the spaces and from washing the recipients (in the laboratory) will be evacuated by means of a R1 connection in the public sewage network of SC ECOAQUA SA CALARASI OLTENITA BRANCH

The wastewater resulted from the gas stripping and the dehydration of the oil will pass through a treatment installation before being evacuated in the public sewage system.

Once a year, the waste water for the cooling of the installation will also be evacuated. Before evacuating it in the public sewage system, it will pass through the treatment installation.

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

Rain water will pass through a hydrocarbons separator and evacuated in the public sewage system, by means of R2 connection.

The distance from the first home will approximately 1 km.

2. Protecting the air quality:

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

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

The main effluent is hydrogen sulphide (H2S), which will be produced in the in hydro-treatment installation. The quantity is small, under 24 kg/ h. It will be absorbed by the amine plant, and then sent to the furnace burner or to the flare. Using MDEA amine is compatible with BAT.

The projects falls under law 278/2013 regarding industrial emissions. According to annex 1 to law 278/2013, the activity of refining waste oils falls under art. "5 Waste management; point 5.1. Eliminating or capitalizing dangerous waste, with a capacity of more than 10 tons a day, letter j -re-refining or other re-uses of oil."

According to the provisions of annex no. 1 of law 22/2001 for the ratification of the Convention regarding the assessment of the impact on the environment in a cross-border context, adopted at ESPOO on February 25th 1991 corroborated with the fact that the proposed investment is close to the border of Romania with Bulgaria, the investment that is developed falls within article 6 ”Integrated Chemical Installations”. The distance to the Bulgarian border is 1000 m,

3. Protection against noise and vibrations:

Observing the sound level, ensuring that it is within the maximum permitted limits according to STAS 10009-88.

The noise level at the limit of the functional area

- equivalent noise level Lech = 65 dB (A)
- value of the noise curve Cz = 60 dB

The noise level inside the functional area

- equivalent noise level Lech = 70 dB (A)
- value of the noise curve Cz = 65 dB
- avoiding as much as possible clashes, irrelevant hits in operations: mechanical, loading- unloading materials, etc.;
- organizing the work schedule so that no overlapping of the noise generating operations is present;
- the equipment that generates noise is positioned in enclosed spaces and it is fixed on a support to diminish noise and vibrations.

4. Protecting the soil and subsoil

Soil and subsoil pollution occurs due to the removal of the soil layer for the construction site.

Various materials are deposited on the soil that affect its quality due to debris and dust remaining after use.

Another pollution source is the leaks of oil products, diluents, paint and other technological waste to which domestic waste can add.

The protection of the soil is made by recovering the soil and temporary storage to use it in the process of technological recovery of the exploited area.

Inadequate storage of materials on the specially designated surfaces and recovering the unusable scraps are also ways to protect the quality of the soil.

The spills of oil products can be avoided by permanently controlling and solving operational defects.

Protection measures

Preliminary storage of waste is done in containers located in suitable areas and sheltered from the weather (rain, snow).

Handling and storage of raw materials should be done in accordance with the legislation in force, in specially designed areas, thus preventing soil and subsoil pollution.

5. Protecting terrestrial and aquatic ecosystems

The studied location is in the close proximity of the community interest site RO SPA 0038 – Danube -Oltenita.

The site ROSPA0038 Danube -Oltenita is positioned on the Danube between km 451 and km 430, is situated in the south part or Romania, in the floodable Danube valley.

The special bird area protection ROSPA0038 Danube -Oltenita – hereinafter named Site ROSPA0038 Danube - Oltenita– is a natural protected area of community interest - the category of area of special protection according to Directive 2009/147/CE of the European Parliament and the Council of 2009 regarding the conservation of wild birds set by the Government Decision no. 1284/2007, declaring the special bird areas as an integral part of the European ecological network Nature 2000 in Romania, amended and supplemented by Government Decision no. 971/2011.

The location of the proposed project is positioned at a distance of 7 towards the site.

On the location there are no habitats of community interest. The characteristic habitat is arable agricultural land and ground vegetation.

The observations made by the beneficiary were performed on the shore of the Danube and of Arges river and as well as in the strict perimeter of the future project.

There weren't any protected species or nests in the development area of the future project. The species observed in the perimeter were observed during the feeding time or in transit.

In order to correctly assess the potential impact of the project in the site ROSPA0038 Danube Oltenita, a multi-disciplinary team that covered all the aspects that need to be studied was involved.

In the operating period, the impact on the environment will be insignificant as the unit will be closed circuit and no wastewater will be discharged into the natural environment nor emissions to the atmosphere, which are taken over by the exhaust systems equipped with performance filters.

The impact of the operating stage on the integrity of the site Nature 2000 is insignificant due to the fact that there isn't a loss of the habitats of interest, there is no fragmentation of the habitats, there is no loss of surfaces of the habitats used for food, rest and reproduction of the species of community interest.

The impact of the operating stage on the conservation of the species of community interest for which the nature 2000 site was declared is insignificant.
The cumulated impact on the conservation of the species of community interest in the site Nature 2000 is insignificant.

The impact of pollutant emissions on the environment and especially on species of community interest is reduced due to the use of high-end technology, by installing advanced filters, by re-circulating the technological water, by installing wastewater pre-treatment facilities.

Also, the monitoring of the bird species during the entire development of the projects and after its execution to see if there are changes in the dynamic of the populations and their numerical evolution.

The analysis and the study of the conditions of the activity, the assessment of its impact on the environment concluded that the activity is justified in terms of the economic development of the area where the objective is.

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

Analysing all the impact factors in the environment we conclude that the project "Waste Oil Recycling Plant, has a reduced impact on the environment, provided that all environment legal provisions are observed.