SUMMARY

“LOCATION OF INCINERATE WASTE AND MOBILE CONSTRUCTIONS”

II. *OWNER*

- ***Company Name:*S.C. ALVI SERV SRL;**
- ***Headquarter address****:* Arad, Bradului Street, no.38, Arad county;
- ***Site address****:* Arad, CET zone, isolated body 103
- ***Telephone number:0337-103508;***
- ***Contact person name: FecheteVolodea***
- ***General Manager: Moraru Sebastian***
- ***Responsible for environmental protection: S.C DIVORI PREST S.R.L.***

III. PROJECT DESCRIPTION:

III.1. A project resume

Intended purchase and placement of a waste incinerator pattern I8-1000 (A 10000) and the

execution of construction type evident efficient mobile activities that will take place on site and increase efficiency in terms of protection of the environment.

Thermal waste treatment processes is a feasible option after recovery variants (collection, sorting, recycling) and controlled before storing. High temperature oxidation transforms organic components in specific gaseous oxides, which are mostly carbon dioxide and water. Inorganic components are mineralized and turned into ashes.

General purpose of incineration of waste is:

1. to minimize the potential risk and possible pollution;

2. to minimize waste volume and quantity;

3. conversion of the remaining substances in a manner that allows their recovery or disposal;

4.transformation and energy recovery;

Work will be done to ensure a flow sheet in accordance with the law and to ensure operation at maximum for performance in terms of protection of the environment will consist of:

1. Location of a waste incinerator latest pattern I8-1000 (A10000) has two combustion chambers, salad and gas venturi system for continuous monitoring of 13 parameters of flue gases

2. Management of an area covered for the new incinerator S=93m^2

3. Arranging a hazardous waste storage area until they are incinerated

4. Location of a weighing machine

5. Location of a tank of diesel with 9000l capacity

6. Location of 2 frigo chambers with V_{total}= 45 m^3 compose of :

V_1 = 15 m^3

V_1 = 30 m^3

7. Management of an area covered for cold rooms S= 98 m^2

8. Arranging a reception area of waste S = 98 m^2

9. Management of an area for temporary storage of hazardous waste S= 80 m^2

10. Indoor yard landscaping S=66 m^2

III 1.1 Equipments Description

III.1.1.1. Waste incinerator

It is equipped with the latest technology both in terms of plant efficiency and the environmental protection facilities.

Figure 1: frontal view incinerator

Figură2: view incinerator from behind (the burners)

I8-1000 model type (A 10000) is the largest in the range. This is a model of incinerator equipped with an air control designed to ensure the best conditions for a very wide range incineration of hazardous waste peril and non peril type.

By equipping incinerator with vertical loading system to ensure fluid retention causing this incinerator to indulge in these types of waste incineration .

Technical characteristics of the incinerator (as listed in the maintenance book) are:

- Used fuel: Disel
- Average fuel consumption: 47 l/h
- Chamber volume combustion: 8,7 m^3

- Operating temperature: 850-1300 C
- Maximum capacity: 5000 kg
- Hourly maximum yield: 1250kg/h
- Gas retention time in the secondary combustion chamber: minimum 2 seconds
- Size (Lxlxh) mm : 6490 x 2000 x 6260 mm
- Own weight : 21000 kg
- Electric power : 5 kW
- The average ash residue: 3%
- Equipment with temperature in the room primary and secondary combustion chamber
- Equipment with automated control system thermostat temperature in both chambers

Presentation of constructive elements of the Incinerator

Incinerator model type I8-1000 (A 10000) is made of:

1. primary combustion chamber
2. afterburner chamber
3. liquid waste incineration plant
4. wet gas cleaning plant Venturi 2-stage (with cyclone)
5. chimney
6. panel
7. centrifugal air
8. tracking system parameters continue flue gas
9. automatic feeding system for waste incinerator

1. *Primary Combustion Chamber-* It consists of a steel casing of 5 mm anodized, high temperature resistant padding on the inside with refractory cement 8-10 cm. This room is equipped with:

- vertical power sunroof fitted with counterweights for handling very easy and secure, all over the room. Because of this waste supply system can be made even during the incineration process.

-combustion system consists of 5 burners controlled operation. These burners are ECOFLAM range that guarantees high efficiency, durability Energy Efficiency with a great and complete combustion. All these burners are designed and tested in laboratories "ECOFLAM", according to EC standards.

Figure 3: EcoFlam Burners

Burners have a fully automated and continuous ventilation. Each burner is individually controlled automation system. The fuel used is Diesel.

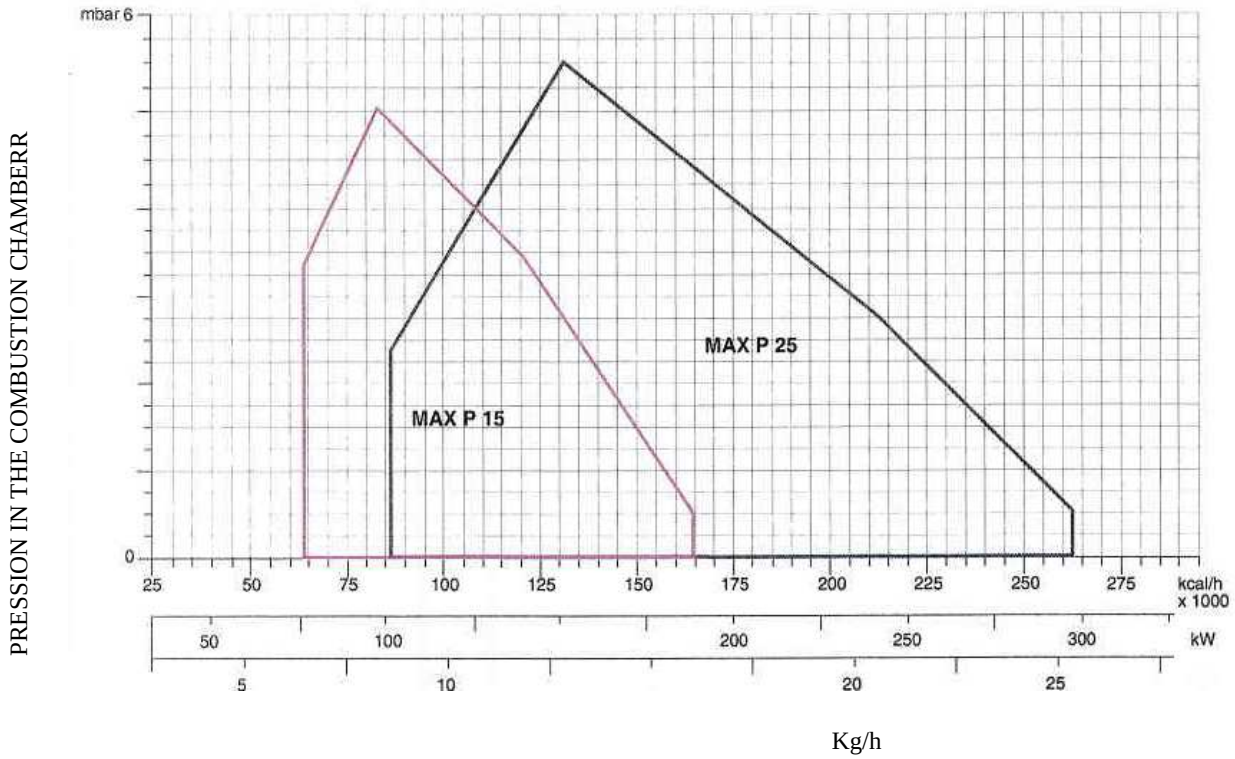
Technical characteristics of the models are shown below:

Table 1: technical characteristics of burners

Crt. No.	Model / Indicator	U.M	MAX P 25 / Values
1.	Maximum Thermal Power	Kcal/h	259000
		kW	300
3.	Minimum Thermal Power	Kcal/h	87720
		kW	102
5.	Maximum fuel consumption per hour	Kg/h	25,4
6.	Minimum fuel consumption per hour	Kg/h	8,6
7.	Power supply	V at 50 Hz	230
8.	Engine power	W	200
9.	Rpm	No	2800
10	Power consumption in flame ignition	Kv/mA	8/20
11	Automation	LANDS	LOA24
12.	Fuel- Light fuel or Diesel	Kcal/kg	10200 viscosity. Maximum at 1,5 E at20 C

3

Performance curves of these types of burners are listed below:



PRESSION IN THE COMBUSTION CHAMBERR

BURNING INDICATORS

Figure 4: Performance curves burners

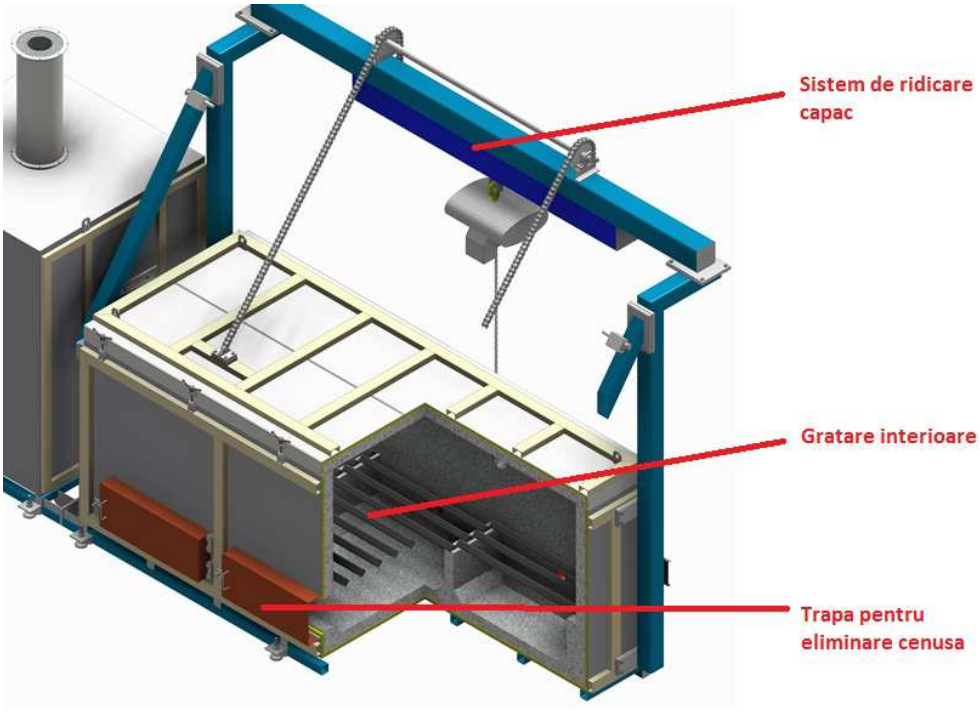
- Temperature system control- Primary combustion temperature in the room is controlled in four zone through 4 thermocouples connected to the automatic temperature control

- controlled air injection system to increase oxygen intake. It consists of a turbocharger system of nozzles and automation elements

- cement support system for grills

Grills system- It is designed in order to provide a more complete and efficient combustion of waste by providing access flames and oxygen needed for combustion. The gratings are constructed of stainless steel bars individual or silicon carbide (carborundum). Indoor grill will ensure homogenous distribution of temperature thus increasing combustion efficiency (kg / h), i**n some cases up to 40%.** Fuel consumption will also be positively influenced by **a reduction of up to 35%.**

-exhaust system ash resulting from combustion of waste -the ash resulting from waste incineration process falls under the grill where it is easily discharged through hatches.



2. After burner chamber-it consists of a steel casing of the resistance anodized 5mm high temperatures padded, inside with refractory cement 8-10 cm. This room is equipped with:

- automated system for retention of burnt gas for 2 seconds at temperatures above 900-1320 C, to provide combustion gases from the primary combustion chamber

- combustion system consists of two burners controlled operation. These burners are ECOFLAM range that guarantees high efficiency, durability, having a great energetic performance and complete combustion. Their characteristics are the same as those fitted to the primary combustion chamber.

The role of this room is to purify gases resulting from combustion of the primary. Thus any suspended solids and gases escaping from the primary combustion chamber, unuim undergo heat treatment of at least 850 C for at least 2 seconds, or 1100 C with 0.2 seconds retention azul incineration of wastes containing> 1 % of halogenated organic substances, expressed as chlorine.

Side burners will come into operation only when the temperature gases from the secondary camera falls below 850 C or 1100 C, as applicable (depending on the type of waste incinerated)

Temperature regulation of secondary combustion chamber will be done automatically by the computer system, depending on the data entered (subject to the type of waste incineration process) by the system operator.

The secondary camera is equipped with an air turbine, automatically controlled, with the aim of introducing oxygen when it is in sufficient proportions.

3. *Liquid waste incineration plant*

It is composed of:

- the suction and liquid waste injection equipped with whirlpool
- the injection of liquid waste

Aspiration is directly from liquid waste storage containers via a (whirlpool) attached to pulling the pump. It consists of a flexible hose made of rubber resistant to organic solvents and other corrosive chemicals which has one end (the one that is inserted into the container with liquid waste) a check valve that is designed to hold liquid column between the head and suction pump drawing.

The pump will manage liquid waste by an injector located in the primary combustion chamber, in front of a fuel injector (front flame).

4.*Construction of gas Venturi wet scrubber*

Wet gas cleaning plant (Scrubber) Venturi is a facility that was designed in order to retain harmful components from the flue gases to protect the air environmental factor. The operating principle is based on removing air pollutants by inertial interception and diffusion.

Figure 6

Parts of the wet scrubber system are:

a)Laundry room equipped with wet spraying network (nozzles)

b) high pressure pump

c) low pressure pump

d) Tank solutions for pH correction

e) basin for waste water treatment (pH adjustment)

f) automation system

Venturi wet scrubber site uses a system of canals converge, followed by a divergent section to accelerate and then slow down the flow of gas, while water or alkaline solution (usually (CaOH) or NaOH) is injected through a network of nozzles. The injection pressure is 80 to 120 bar.

Make alkaline solution react with acidic substances such as HCl, HF and SO2, forming insoluble salts aspect slam. Removing these salts is done periodically and introduced in the incinerator.

The gas passing through the diverging section, there is a pressure drop, resulting from passage through the convergence that is recovered in large scale and sustained pressure generated by burning and circulation system. Water droplets that have a low rate compared with gas, need a longer time to browse through the venturi nozzle. During this time water droplets adhere to the majority of particles contained gas (up 98%).

At the end of the journey through the washing plant water it is drained through a hole at the base washer (scrubber) is collected in a tank equipped with a stirrer and pH sensor. Depending on the sensor readings are automatically dosed substances until reaching a neutral pH and then recycled.

Figure 7

The resulting slurry from washing process gas is collected at the bottom of the basin where periodically extracted and burned in the incinerator.

Flue gas after passing through the wet laundry room they are discharged from the top and passed through a cyclone which is designed to ensure maximum performance purification of such gases

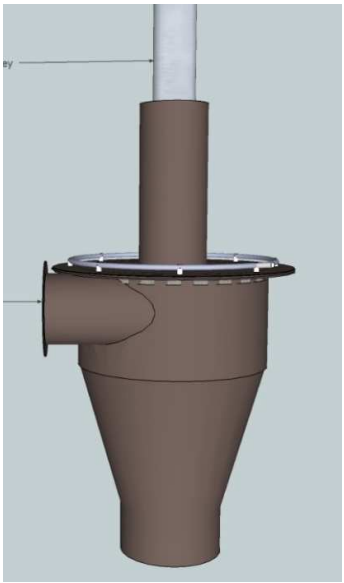


Figure 8.

Hydro cyclone uses centrifugal force resulting from the speed of the exhaust gas scrubber engaging particles hitting the wall tangential to a rotational motion. Conical wall particles and will direct the washing water to the lower part of the scrubber where they will be discharged through the opening at the bottom of the cyclone and from there are led in the water tank.

The purified gases are discharged through the chimney installed at the top of the cyclone.

Of gas scrubbing process does not result waste water because the water is recirculated in its entirety. This process results only sludge is collected and disposed of by incineration in the incinerator analyzed

5. *Chimney*-Steel is made of high temperature resistant and has directed evacuates the combustion gases exiting the cyclone.

6. *Control Panel*-This is to ensure automatic operation of the incinerator and to ensure correct operation and its real-time.

Control panel is a complex of electronic components, electrical and electromagnetic controlling incineration process in all areas.

Control panel is equipped with thermocouples connected to the receptors located in the combustion chambers of the incinerator processors for data analysis and command elements temperatures in the combustion chambers through thermostatic.

In the control panel are tearing in real time and record the operating parameters of the incinerator.

Each area of the primary combustion chamber and afterburner chamber are fitted with ceramic high-precision thermocouples. It measures the temperature of the combustion chamber and transmit data to the control panel which, according to information received purchasing orders in order to ensure optimal combustion temperatures in these rooms.

Temperature and burning time are controlled by the operator via the controller or touchcreen.

Before each burner ignition module automation components make a check burners. In case of failure, it locks operation (initializing ignition) and displays signal fault. After completing the test, will begin a verification process prepurjare (ventilation) of the combustion chamber, approx. 30 sec. At the end of this pre purge valve is open electromagnetic circuit is turned on fuel and flame.

In case of failure, it triggers visual and audible alarms 2, which alerts the operator.

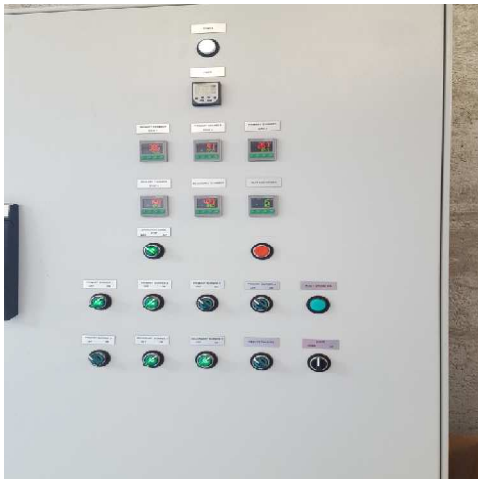


Figure 9

7. *Centrifugal air*-is an ensemble consisting of an electric motor and a centrifugal pump air

Figure 10

Centrifugal fan for air blow in both combustion chambers, ensuring excess oxygen during periods when, waste incineration process, the required oxygen for combustion is high. By additional intake air (and thus oxygen required for a complete combustion) are provided stoichiometric conditions of the combustion process so that it be located as close to complete combustion. Airflow rate setting in the two combustion chambers (primary and secondary) will be done through an automated system installed in the control panel.

8. *Tracking system parameters continue flue gas*

The installation of continuous emission tracking is composed of two main parts, namely:

1.The installation of measuring, in real time, gas-burning parameters is made up of 13 electrochemical sensors for 13 different parameters, namely:

- level O_2 : measures the interval 0-25%
- level CO: measures the interval 0-2000 ppm
- level NO: measures the interval 0-1100 ppm, as follows:
  - NO-interval 0-100 ppm
  - NO_2 -interval 0-1000 ppm
- level TOC: measures the interval 0-900 ppm
- level SO_2 : measures the interval 0-1000 ppm
- levelHCl: measures the interval 0-1000 ppm
- level HF: measures the interval 0-10 ppm
- level of humidity: measures the interval 0-90%
- level of dust
- pressure combustion gases exiting the cyclone
- flue gas temperature at the exit from cyclone

2. Installation of interpretation of information provided by sensors and their recording consists of analyzers (transducers) process computer and LCD display.

This system is mounted on the exit gases from the gas cleaning plant, the measured parameters are displayed in real time on the operator panel equipped with touch screen and large display. The data is recorded and stored on electronic media to be accessed when needed.

Sampling

Analyzed gases are collected using sampling probe which is installed on the chimney. They are transported to an analyzer through a pipe INOX. To be analyzed gases are brought to normal temperature. For this circuit sampling and gas transportation is provided with heating system equipped with thermostat to prevent freezing in winter.

M**easurement and interpretation parameters**

The flue gases collected at the exit of the incinerator chimney are routed past the right level of specific sensors which measurement parameters is performed. Values are amplified, interpreted and encrypted using software algorithms. Measurement parameters are continuously displayed values are instantaneous. The maximum time for a course record of 2 min.

Recorded data is stored digitally encrypted and more accurate monitoring parameter values of emissions (NOX) and are made available to users by connecting to a PC, mobile phone or USB memory directly.

Control operation

Operating parameters are displayed in the control panel and / or PC. Control is using touch screen panel (touch screen) with intuitive interface or remotely via a PC.

Failure or malfunction

In case of exceeding the emission ceilings or in case of failure beep sound and light to be able to intervene in time. These statements are evidenced by clear and specific displays such as:

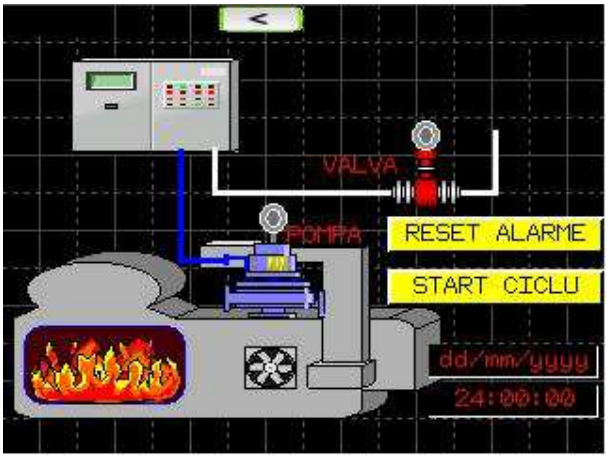


Figure 11

9. *Automatic system with waste incinerator*

This system has 3 distinctive components:

1) Automatic system with municipal solid waste incinerator, consisting of a set of metal arms with a forklift maneuverable. These arms are anchored containers with a forklift and raised above the power of the incinerator. He reached this position the containers are emptied by overturning incinerator.

In case of incineration of large animals they are introduced into the combustion chamber with a forklift.

2) automatic feeding system with waste incinerator non pumpable-viscous consists of an assembly of:

- transport system in metal tubing screw. Both components are made of corrosion-resistant materials, organic solvents, etc.
- electric motor for driving the screw conveyor
- waste disposal device of the conveyor screw into the combustion chamber of the incinerator

3) automatic feeding system with liquid waste incinerator, consisting of:

-Liquid Suction System

-suction pump and injection

-injector

III.1.1.2. Weighing machine

Weighing machine is designed to clearly highlight all quantities of waste that enters the company for processing (shredding) or their removal. It will be mounted on the existing concrete platform being sandwiched automotive supply route at the entrance to the site.

It adopted a platform weighing solution using above-ground modular, with a robust steel structure, which will provide one of the most important advantages for such a product, namely, mobility.

Figure 12

Main features of this platform that makes it one of the most recommended in the market are:

- IPE200 structures using profiles that provide additional robustness necessary resistance in case of trucks weighing up to 15 tons.

-Failure tread deformation in the tread due to the use of external board with strips of thickness 8mm

-Thumbnails of with the structure mounted

-Eliminating masonry works required to install a platform buried

-Resistance to corrosive factors due to special treatments and corrosion paint (two coats)

-Flexibility allows the use of so-ramps Show off but concrete ramps built by the beneficiary

-Uses weighing cells capable of satisfying the most special application requirements and accuracy, which is certified by WEIGHTS & MEASURE AUTHORITIES, Worldwide

-Increased efficiency due to the possibility of using special software application developed to replace and take over the functions of weighing terminals and bringing the main advantage eliminate hardware limitations.

-Weighing Division is 5 kg

-In terms of metrology, precision class III platforms is self-OIML

Parts of weighing machine are:

1. bridge running-is composed of a single module of 6 meters long, this metal structure providing capacity scales to weigh vehicles with a maximum weight of up to 15 tons.

2. Weighing cells -will use torsion cells attached to the metal structure so that a possible relocation they do not have to be detached from it. The platform will use 6-cell weighing. They will be connected to a junction box which benefits from an index of protection IP67 dust and moisture.

3. Ramps one climb and a descent each have a length of 3.5 meters each. Ramps will be made concrete by the Beneficiary shall on the basis of specifications provided by the manufacturer.

4. Electronic weighing terminal and is intended to elaborate, totalization, data visualization and printing. It is designed specifically via junction box to connect with all kinds of cell type-approved analogue weighing sieste intended for use in industrial environments

Figure 13

5. software -application usage in operations weighing software will install a computer and a printer in an enclosure (office) at a standard distance of 20 meters from the car platform.

Figure 14. **Diesel Tank**

III.1.1.3 Diesel tank

It is intended for storage of diesel that will power the burning incinerator.

It will be provided by the company TotalMet Prod Construct SRL has the technical agreement (Declaration of Conformity) for tank TM9003 series and has the following specifications:

-Geometric real-capacity 90 541

-Maximum fill volume allowed 90%

-drum retention capacity-45871, size:

-L=3750 mm

-L=2100 mm

-H = 560 mm

-material execution carbon steel S235JR as per EN 100 25

- total weight empty-1200kg

- manhole-Dn=50 mm equipped with:

-fixing screws with hexagon nuts

-gasket

-quick coupling lockable

-safety valve to reduce pressure and breaking sieve flame

-pipeline connecting the tank adapters equipped with fine copper connection

-Drain the bottom of the tank equipped with safety cap for periodic cleaning

-suction hose equipped with uni sense way valve and faucet that is designed to allow decanting of diesel needed

-Corrosion protection consists of two layers of anti-corrosive primer and a coat of paint for both the tank and retention tank

- constructive dimensions:

- L= 3400 mm

-Diameter Ø = 1900 mm

Diesel tank is equipped with a distribution pump acquired in order to supply 1000 liters tank, which is on site and fueling, in turn, the incinerator works, authorized, reviewed the site.

Figure 15.

CUBE is 50/70 type pump is produced by SUZZARA (MONTOVA) ITALY and holds respecting the declaration of conformity 46 029 International Standards.

-EN 292-1: CUBE is 50/70 type pump is produced by SUZZARA (MONTOVA) ITALY and holds respecting the declaration of conformity 46 029 International Standards

- EN 292-2:Safety Appliances-Basic concepts, general principles for design Specifications and technical principles. Safety Appliances-Distance needed to prevent dangerous areas to achieve by the upper limbs

-EN 294: General Rules related to electromagnetic compatibility, immunity-premises industrial, residential, commercial rooms

-EN 61000-6-1: General rules relating to emissions-residential premises, commercial and industrial

-EN 61000-6-3: Safety equipment, electrical equipment of machines. Safety in domestic use electrical equipment, special rules for pumps

- EN 60204-1:Safety in using domestic-domestic installations special rules for distributors who pay or no fuel (electricity or gasoline)

- EN 60335-1:Italian National Decree

- EN 60335-2-75:DM 31/07/1934 N-Title I, XVU approval regulations concerning the safety rules related to storage, use and transport of diesel

III.1.1.4 Cold rooms

To ensure the conditions for waste storage certified organic (categories 1 and 2), to their entry in the incineration process, has provided drive and installation, in the area adjacent to the new incinerator, two cold rooms with capacities of 15 and 30 m^3 . They will be equipped with refrigerators performance and will be used as a refrigerant Freon R 410a ecological type.

III.1.5. Hazardous waste storage area

Solid hazardous waste storage area, pasty, liquid-unpumpable and is situated at a distance of 18 m from where the new incinerator will be located on concrete platform covered and well-ventilated dimensions:

- S = 870,3 m^2

- L= 13,77 m

- l= 5,83 m

It has adopted this solution to avoid the potential risk of fire in case of accidents due to possible operating errors.

The platform is located on the northeast side of the site (see location plan attached) at the entrance to the site on the left. It chose this area to be more isolated from the rest cant site with concrete access path, in an area that would allow container handling safety.

This area will be fenced with wire mesh and will be divided into three compartments, one for solid hazardous waste, one for unpumpable pasty hazardous waste and one for hazardous waste liquids.

Hazardous waste solids will be transported and stored (if applicable, if they can not take part directly in the flow of incineration) until the incineration (a few hours) in metal containers special V = 1 m^2 in cell 1 of the storage. The containers will be fitted with lids.

Hazardous waste pasty unpumpable be transported and stored (only if necessary or if they can not take part directly in the flow of incineration), until the cremation (a few hours), in containers of materials resistant to corrosion and all types of solvents (being specifically for such substances with V = 1 m^2 in two of the storage cell. These containers will be equipped with sealing lids to prevent the release of harmful emissions health.

Liquid hazardous waste will be transported in special containers with V = 1 m^2, fitted with lids will be temporarily stored in the cell in March.

Handling of containers with hazardous waste, both solid or liquid and pasty unpompable, would only be automated, such as:

-loading and unloading from vehicles will perform fork lift and / or crane (only when it is necessary)

-transport containers at temporary storage area to the incinerator will be with forklift.

Emptying containers in combustion chamber of the incinerator will be using a forklift and automated supply.

All containers used to transport hazardous waste of any kind, from the generator to the incinerator (for disposal by incineration will be containers approved owned generator. Generators of hazardous waste are required under the law and regulatory documents in the field of protection environment (environmental permit, integrated permit environmental), have equipped for the collection and temporary storage, suitable containers and certified. They are also used to transport the eliminatory authorized. After emptying the containers are closed and are returned to their owners without to be washed or cleaned.

The maximum capacity of the landfill will be dangerous 18t, being divided equally on the three compartments. The compartments will be organized with two side storage areas and access road in the middle order to maneuver with a forklift.

Compartment for storage of hazardous waste and the waste unpumpable pasty liquid hazardous areas will be organized so as not to find a place containers containing waste that can react chemically with each other. Also containers containing highly corrosive waste will be stored on the same side, inscribed in this area.

III.2 The justification of the Project

Implementation of the proposed project was designed with the idea of developing the company's business both by increasing the capacity of waste incineration and by diversifying activity by both incineration and hazardous waste to a larger pool of hazardous waste.

It also plans to create new capacities for cremation geographic area that includes the counties of Arad and around it by equipping high performance to meet the highest technical standards and environmental protection.

III.3.Boards representing limits of the project site, including any requested area to be used temporarily (the site plan and locations).

Attach situation Attached plan highlighting the project objectives.

Physical forms of project (plans, building other structures, construction materials, etc.)

III.4.Physical forms of project (plans, building other structures, construction materials, etc.)

Project implementation involves the development of lightweight construction industry, metal frames, respectively:

-metal poles for support

-metal building roof trusses

-fireproof sandwich sidewall panels

All these lightweight construction will be placed on existing concrete platforms on the site. PROPS platforms will be achieved through connections with metal anchors that are fixed with bolts in the concrete.

–Site organization

Site organization will be placed inside the concrete platform SC AlviServ LLC, representing an area of ca.100,0sqm area of a land occupied temporarily.

Site organization shall perform the following functions during the time of the works:

-stationary equipment;

-zone storage equipment and materials, putting them to work;

-zone temporary storage of waste in the construction phase.

After completion of the construction and placement of equipment, land area occupied by the site organization will be released.

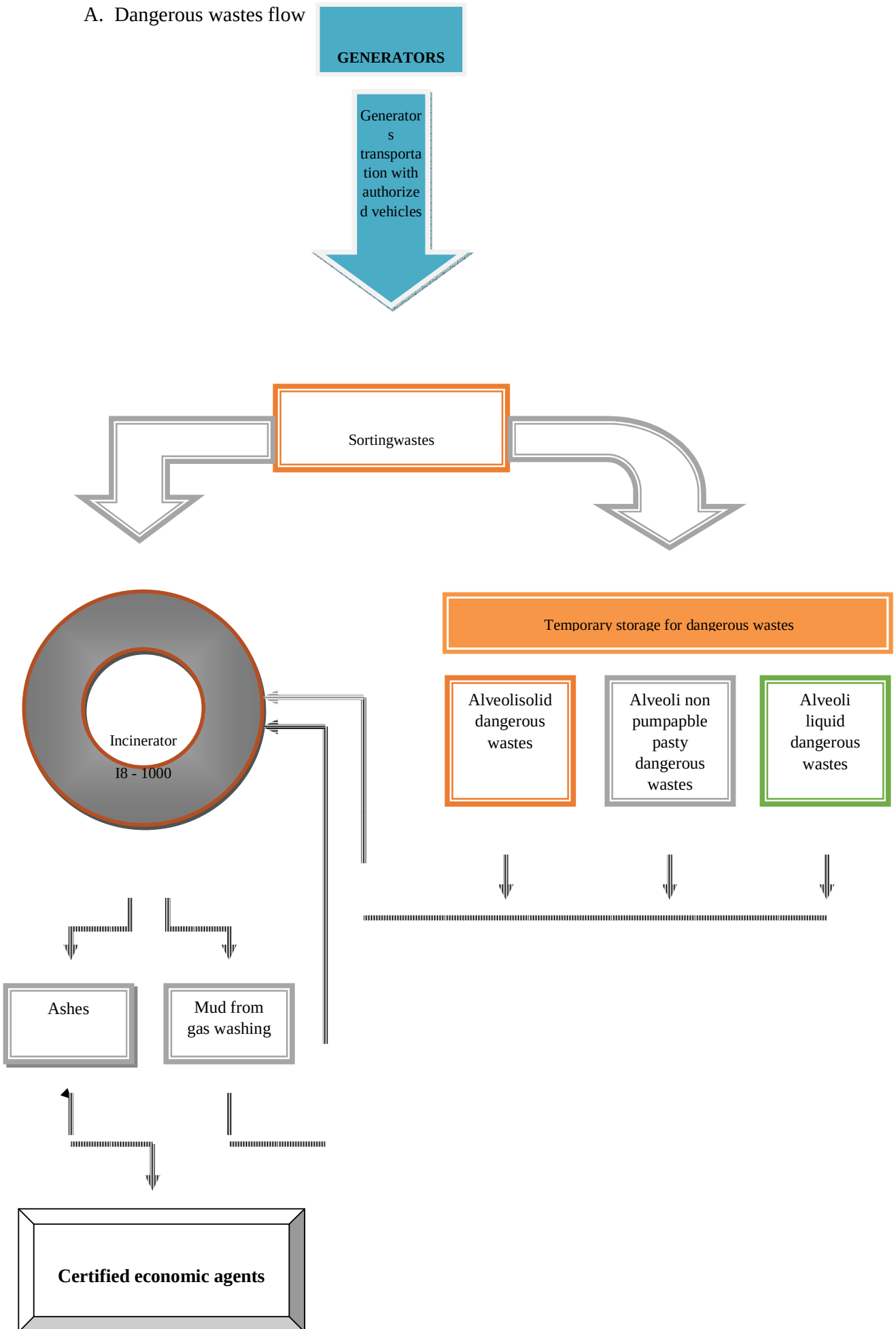
III.5.Specific elements characteristic of the proposed project

Profile production capacity

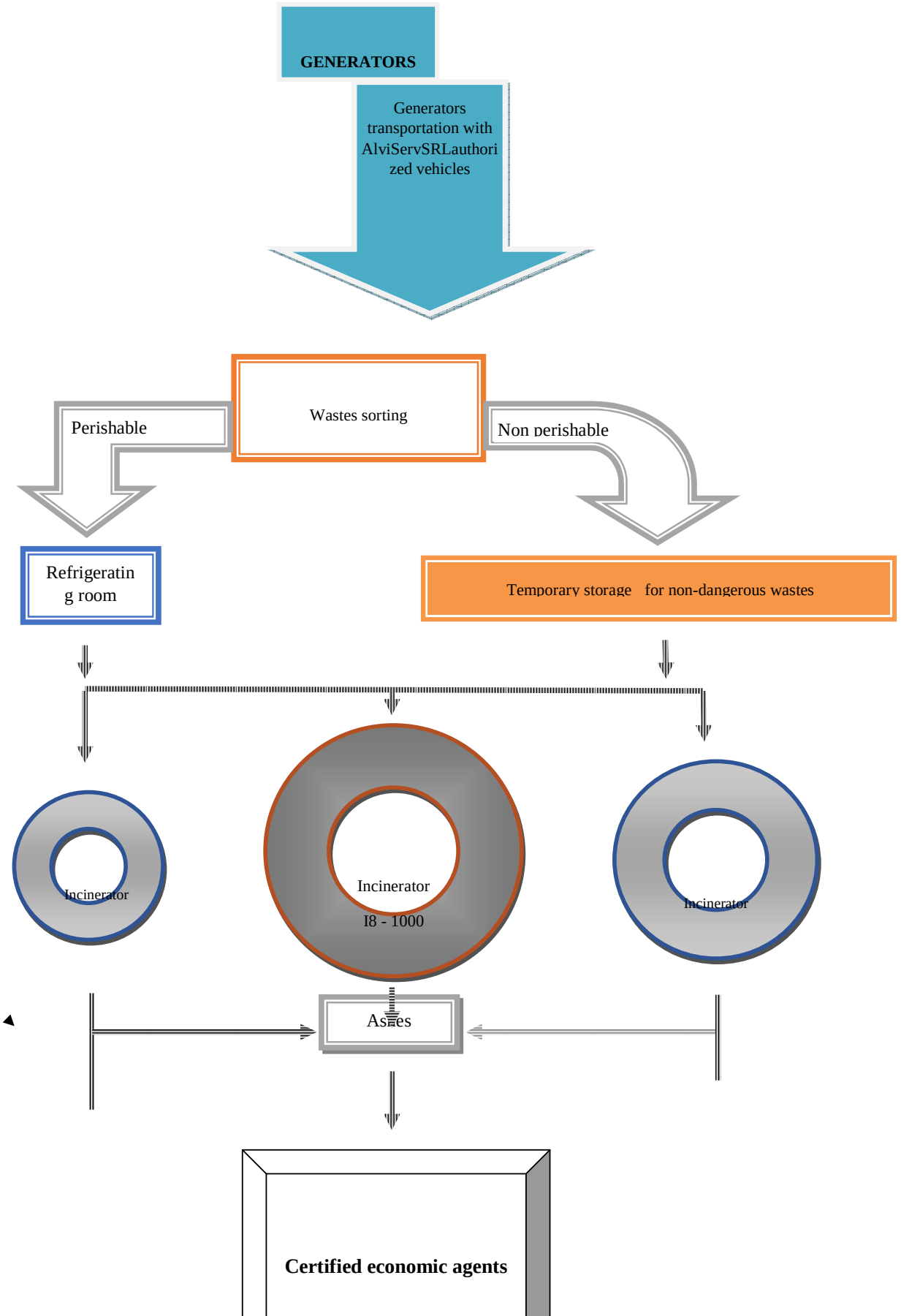
The work to be conducted is non-hazardous and hazardous waste incineration. The technmological flows for incinaretating dangerous wastes and non dangerous ones are presented

below:

A. Dangerous wastes flow



B. Non dangerous wastes' flow



In order to determine the incineration capacity one may take into account the following aspects:

1. maximum capacity: 5000 kg

2. Hourly maximum yield: 1250kg

3. The time required for a cremation charge:

-5000 Kg capacity 1250 kg / hour = incineration for power at maximum capacity.

- incinerator will not be able to never fill to capacity if it is to obtain maximum firing rate of 1250 kg / hour. To achieve this rate we recommend a maximum load of 75%. Hence a burning capacity per charge 3,750 kg / 4h (where it takes into account the time required to initiate and conditions of incineration or incineration conditions for achieving the primary combustion chamber)

-each batch of burning incinerator must be cooled 2h to intervene feed and ash removal and prevent damage to the refractory cement mantle

-Opening time needed to perform operations incinerator ash venting and extraction results and technical verification before a new supply is minimum 2.5 hours

-time needed to perform all operations supply and closing the incinerator is at least 1 hour

4. the total time for a charge combustion (the maximum output) is 4 + 2 + 2.5 + 1 = 9.5 hours

5. maximum number of batches / 24 hours is 24: 9.5 = 2526

6. maximum capacity of incineration for 24 hours maximum on the number of batches x burning capacity for a charge, namely:

- 2,526 x 3750 = 9472,5 kg/24h

Raw materials, energy and fuel use, by the way, their insurance

Raw materials used in the incineration process:

-Non-hazardous waste

-solid hazardous waste

-unpumpable pasty hazardous waste

-hazardous waste liquids

tables with all these wastes and related codes (according to HG 856/2002) constitutes Annex 1 and Annex 2 to this work

Electricity - power supply incinerator will be the location of the existing network which, in turn, is connected to the local electricity distribution.

Maximum power consumption of the incinerator is given by:

installed electric power x no. operating hours / day = 5kW x 10 = 50 kW / day

For related activities (power lighting systems operated incinerator, etc.) is estimated consumption cca.2kW / day.

Complimenting all potential electricity consumption to reach a maximum consumption of 52 kW / day and an annual consumption estimated by the formula:

no. operating days / year x daily consumption = 320 days x 52kW / day = 16640kW / year = 16.64 mW / year.

Fuel used

The fuel to be used is diesel and activities which will be used are:

1. waste incineration activity:

-consumption of hourly fuel = 47L

-No. Maximum hours per day = 10 hours

- The estimated maximum daily consumption of fuel = 10:00 x 47L / hour = 470 l / day

- Maximum estimated annual fuel consumption = 470l / day x 320 days / year = 150 400 l / year = 150.4 t / year

2. consumption for trucks serving incineration activity (transport with special fire and waste handling with a forklift), about 5t / year

Diesel fuel incinerator will be in the tank will be installed on location (with a capacity of 9054 l) through a special endowment incinerator.

The supply with fuel of the special trucks that will serve the incinerator will work in the authorized space distributing fuels.

Connecting to utility networks existing in the area

Connection to utility networks existing in the area, is as follows:

-P*ower supply*: by air and underground connections to the existing installation location of SC AlviServ SRL or its local distribution of electricity.

-*Water supply*: it will use the existing power supply on site, linked to the city network

-S*ewage network :* will use existing on site sewage that is connected to tank emptying existing concrete on site and authorized capacity 80mc

-*Thermal energy*: Not applicable

Description of site rehabilitation works in the affected area of investment execution

Not the case, because all the work will be executed on existing concrete platform on site

New avenues of access or changes in existing ones

Not provided new avenues of access or changes in existing ones

Natural resources used in construction and operation

The construction period will not use natural resources.

During the operation, will be used:

-water for washing containers used to transport hazardous waste animal-around. 50 mc / month

-fuels from refining non-renewable energy resources-oil (diesel) = estimated maximum amount cca.155t

Methods used under construction

In the process of locating the incinerator and lightweight construction will use conventional methods, namely:

-Location metal poles supporting lightweight structures anchoring chemical mechanical anchors, that means:

-making holes in existing concrete platform

-introduction of chemical resin

-introduction of metal connections for anchoring bolts fitted with load-bearing columns

-placement of metal structures on pillars mount

-cover specific materials

-location of electrical connection

Execution plan, including the construction phase, commissioning, operation, restoration and future use

Construction phase

Execution Plan was prepared in compliance with all legal provisions in force. Also it will be observed all provisions of opinions and agreements that led to the issuance of the building permit.

Commissioning of the investment- is made after completion of all construction works and its connection to utilities.

When completed the building will be made by the authorized institutions and reception will check whether the provisions opinions and agreements.

Commissioning of the investment will be made only after obtaining all operating permits.

Exploitation incinerator operation should be carried out in strict compliance with all provisions contained in operating permits

Reducing and subsequent use- re-estimated running time, is at least 20 years. After which time there are 2 variants of exploitation of evolution, namely:

a) Continuing work in the same field but with a refurbishment incinerator

b) Giving up activity of incineration and playing ground for use in the initial purpose or for other purposes. If decommissioning will be performed several operations:

-will remove electrical cables and be transported from location

- will decommission the incinerator and landfill

- will be transported to a location authorized equipment used for the activity of waste incineration

- will reduce the land to its original state or concrete platform will be given other use depending on the interests of those moments

The relationship with other existing or planned projects

It’s not necessary

Providing new water sources

It’s not necessary

Power transmission lines

It’s not necessary

Increasing numbers of homes

It’s not necessary

Sewage disposal and waste

Waste water generated from washing containers used for transporting animal waste will be collected in septic tanks with capacity of 80 cubic meters (available on site) and will carry vidanja the treatment plant of Arad by authorized companies.

Waste (incineration ash) 5 containers will be collected in January 1100 which will be placed in special places (in compliance with environmental legislation) and will be recovered or disposed of by specialized and authorized agents. These wastes are analyzed in chapter 8.

Other permits required for the project

By urbanism certificate no. 1815 of 08.29.2016, issued by the City of Arad were asked:

- D.A.T.C
- Power supply
- Fire safety
-natural gases
-Public health
- The environmental

Project location

-distance from the border for projects that fall under the Convention on Environmental Impact Assessment in a Transboundary Context, adopted in Espoo on 25 February 1991, ratified by Law no.22 / 2001.

The project falls under the Convention on Environmental Impact Assessment in a Transboundary Context that is found in paragraph 10 of Annex 1 of Law No. 22 22.02.2001- "Plants waste disposal: incineration, chemical treatment of hazardous and toxic waste dump" . The project is located at a distance of 14870 m from the nearest point on the border between Romania and Hungary.

.

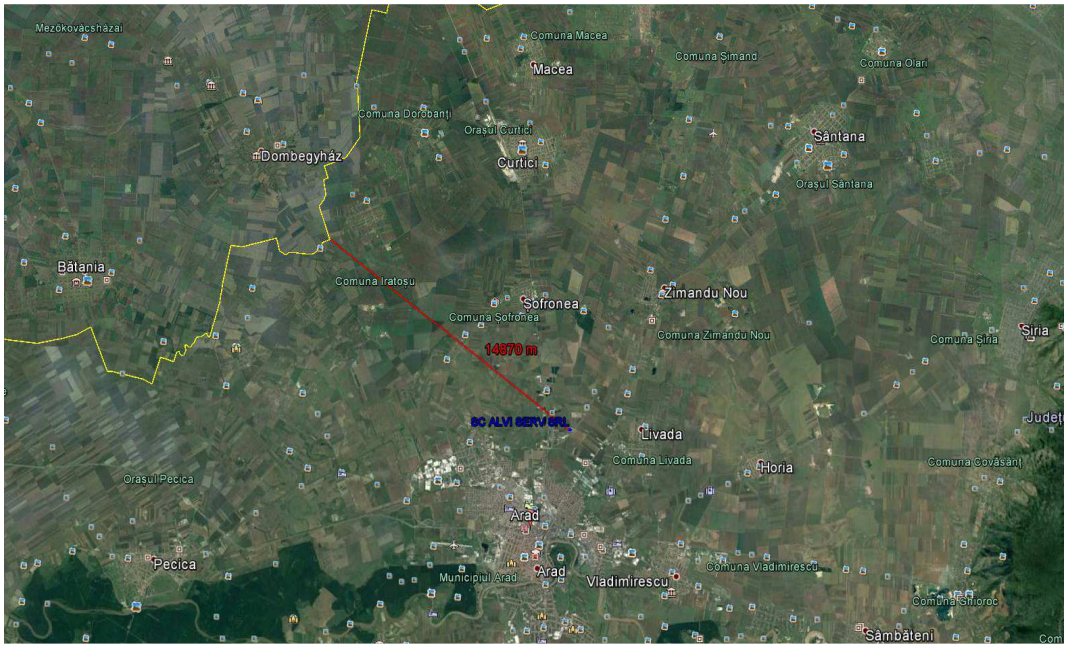


Figura 16

In this case the objective environmental impact of activity must be examined in accordance with Schedule 2 to Law 22 of 22.02.2001. The minimum information that must be found in the documentation for environmental impact assessment are:

A. Description of the proposed activity and its purpose this aspect has been covered in previous chapters.

B. description, if possible, alternatives (ex, location or technology) to the proposed activity, including giving up the activity - this has been covered in previous chapters. Regarding quitting the proposed activity to develop is not the case since:

-activity will not be a source of pollution that adversely affect environmental factors

-activity is very beneficial and necessary to increase the capacity of regional waste disposal by incineration because at the time of this analysis there are multiple sources for generating large amounts of waste that must be disposed of by incineration and there is sufficient incineration capacity.

C. description of the environment likely to be affected by the proposed activity and its alternatives, this will be treated in subsequent chapters

D. describe the potential impact of the proposed activity on the environment and its alternatives and an estimation of its importance - this issue is addressed in the following chapters

E. description of the proposed improvement measures to reduce as much as possible the environmental impact -this issue is addressed in the following chapters

F. precise indication methods and underlying assumptions as well as the relevant environmental data used, this will be treated in subsequent chapters

`G. identification of gaps in knowledge and uncertainties encountered in compiling the information required- not the case because the information held is accurate and complete as there are uncertainties in their compilation

H. shaping surveillance and management programs and any plans for further investigation for the project, whenever appropriate - this will be treated in subsequent chapters

I. a non-technical summary including a visual presentation (maps, graphs, etc.) whenever necessary - this has been covered in previous chapters partly being treated in subsequent chapters

-maps, photos of the site who can provide information on the physical characteristics of the environment, both natural and artificial and other information on the pro

Plain studied area is part of Arad which is part of the Western Plain. This is a plain built up, ensemble through sediments in a marine basin and then Miocene and Pliocene lake in time: clay, marl, sand, gravel. Geologists call these *Pannonian t*erm deposits (from the Pannonian Basin) because of their monotony and the difficulty of separating the horizons of different ages.

Arad is situated in Arad at 46 degrees 11 'N latitude and 21 degrees 19' longitude V.

Arad is located in the western part of the country and stretches from the Apuseni Mountains to the broad plains formed by rivers Mures and Crisul Alb. It is bordered to the north and north -east with Bihor County, east of Alba County, southeast of Hunedoara, Timiscounty to the south and west with Hungary.

Extreme points are 20grd 45 "long E (Nadlac west) and 22grd 39" (Tarnavita east) long.E respectively 45grd58 "(Labasinti south) and 46grd38" latitude (north Berechiu). However presenting a diversity of ecological conditions caused by variability in space-terrestrial factors telurico soil and cosmic-air.

Fig 17. Administrative map-Arad county

Arad county is characterized by having a varied landscape and storied proportioned from west to east, in the field, by setting up the following forms: from meadows and ancient deltas (with altitudes of 80-85 m), plains half drained (85- 100m) plains piedmont, plateaus and foothills, high hills, depressions under and intermountain with altitudes up to 1486 m (Pick- the Chicken in Bihor mountains), with geological structures and paleographer specific related to evolution in time and space the western part of the country.

The natural landscape of the county is characterized by the presence of a tiered relief from east to west, well distribute a tributary hydrographic network in most of the two important rivers, Mures and White Cris, this temperate continental climate with oceanic influences and not least the presence of a diverse fauna with high value items. The relief is grouped in approximately equal proportions, being the mountainous step, step hills, depressions and plains, lanes and stage, each group accounting for approximately one third of the total area of the county.

The most representative relief units grouped in the county are: Codru-Moma with the highest heights achieved in Plesu Peak (1112m), Bihor Mountains with the hill called Gaina (the Hen) (1486m) –stone for three boundaries and stone Arad Peak (1428m) Zarand Mountains, Piedmont Forests Depression Zarand, depressions Moneasa-Ramsa, Almas-Gurahont Depression,Halmagiu Hills ,MuresLipovei passageway (Lipova-Pietris), Arad Plain, VingaPlain, TeuzuluiPlain (CermeiuluiPlain) White Cris.Plain

Figure 18. Map of Arad county-landscape

From the viewpoint basin area of the county Arad, belongs to four major watershed rivers in western Romania: Mures, Cris White, Black Cris and Bega. They add a number of tributaries, which noted for Mures River Valley Corbesti, Troas, Barzava, MilovicCladova for CRIS White Halmagel, Leucate, Tacasele, Cremenoasa, Zimbru, Dezna Valley, MoneasaValley, Talagiu, Hontisor, Chisindia and for Black Cris the affluent Teuz.

Flowing water are added and lakes as: Taut (lake), Seleus, Cermei, Rovine and ponds as Gypsies' Lake

Figure 19. Hydrological map Arad county

Current and planned use of the land on both the site and its surroundings

Legal Regime Regulations

According to the documentation of the General Urban Plan of Arad "analyzed the land is private property AlviServ SRL and SC are located in isolated body UTR no.103, with 339 010 cadastral number.

Throughout the execution of works and after execution, the land remains the same owner.

Economic regulation regime

-PUG (Urbanistic General Plan) destination as industrial construction in isolated body in town

-current use of the land, construction yard

Technical regulation regime

-surface-4824.00 sqm

-height-downstairs

-construction should be made of durable material specific to this kind of work

current use construction yard

Policies zoning and land use

The site analyzed is located, according to project no.308 / 21.10.2015 "concerning criteria for zoning and framing of streets located in Arad" in the north industrial area which has been included in the zoning category A.

No changes are foreseen to use the current regime.

Sensitive area

The site analyzed is not located within or in the vicinity of sensitive areas.

The nearest protected area is **ARIA SPECIAL Protected Areas ROSPA0069Mures Lower**

M**eadow** (at a distance of 7680m) and **SITE OF COMMUNITY IMPORTANCEROSCI 0180 Lower Meadow Mures** (at a distance of 7680m)

Fig.20 Distances towards protected areas.

Details of any alternative location that has been taken into consideration

At this time it cannot be discussed alternatives of realizing the project. From a technical standpoint, at this moment, an alternative option of the project is not taken into consideration.

Characteristics of potential impacts, to the extent that such information is available

A brief description of the potential impact taking into account the following factors:

The impact on the population, human health, fauna and flora, soil, utilities, material goods, quality and regime quantity of water, air quality, climate, noise and vibration, landscape and visual environment, historical and cultural heritage and on the interactions between these elements. The nature of the impact (direct impact, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative):

The impact on the population, human health

The site analyzed is located in an exclusive area for polluting activities in Arad. This area was declared polluting industrial area by the City Council Arad.

In this area there are economic agents operating with a high degree of pollution such as:

CET Arad

Municipal waste sorting ramp

The nearest house is situated at a distance of 1424 m.

For the reasons outlined above there is no question of existence of a negative impact on the population and human health resulting from the incinerator which is intended to be functioning there.

AlviServ SRL company'sbusiness development through this analyzed project implementation will

have a positive impact on the population by creating new jobs.

The impact on fauna and flora

Given the characteristics of the site analyzed is no question that there is a negative impact on flora and fauna resulting from the project.

Impact on Soil

Since all activity takes place and will take place on the existing concrete platforms there isn't a negative impact on soil generated by the project.

Impact on utilities, material goods

It's not necessary.

The impact on the quality and quantity of water regime

This will be analyzed in chapter IV.

Impact on air quality

NOX emission values according to traffic and major stationary source inventory are shown in figure 22.

Combustion in the energy industry represents 9% of total inventory emissions, burnt from other activities 2%, while emissions from road transport accounts for 89%

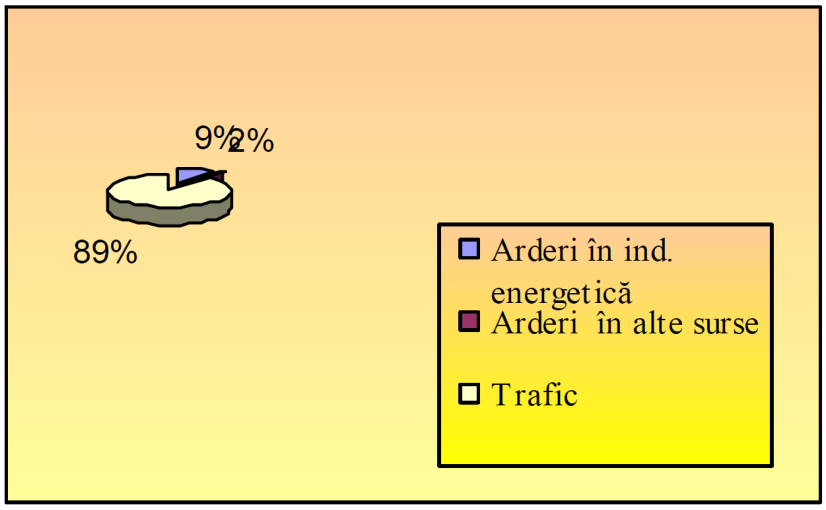


Figure 22: Sources of nitrogen oxides emissions (Source2: own processing, data APM Arad).

In Arad an important indicator influencing air quality is the particulate matter, which had an upward trend in the period under review (Figure 23).

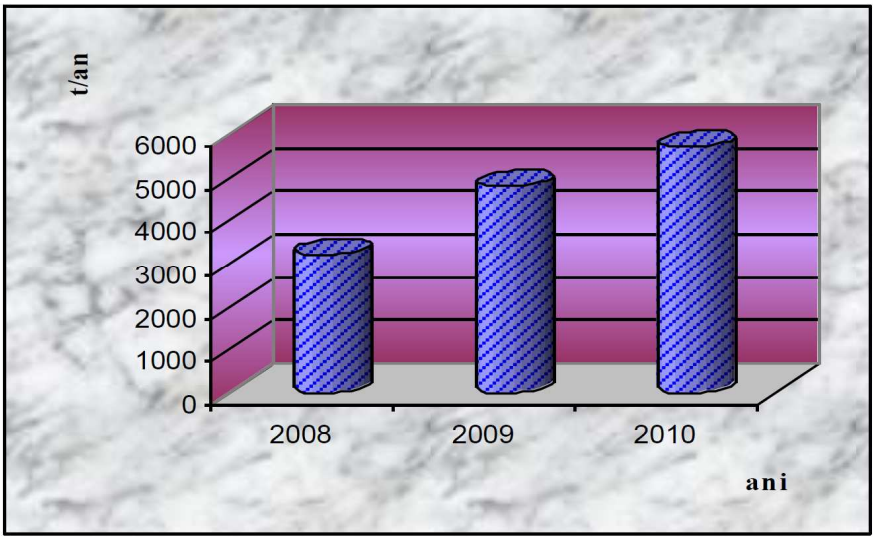


Figure 3: The emission of particulate matter (Sursa3: own data processing Arad APM/EPA)

Arad air quality is monitored by continuous measurements in the two monitoring stations located in Arad (AR1 and AR2), and a station located in Nădlac according to the criteria specified in legislation, representative areas for each type of station:

- Traffic / Industry Station

- Urban background station

- Suburban / Traffic Station

In these stations continuous measurements are carried autfor : Sulfur dioxide (SO2), nitrogen oxides (NO, NO2, NOx), carbon monoxide (CO), particulate matter (PM10 and PM2.5), ozone (O3) and organic ozone precursors (benzene, toluene, ethylbenzene, o-xylene, m-xylene and p-xylene).

In order analyze incinerator development activity over the air environmental agent, one will carry out an analysis over the existence and the activity objectives / installations under its vicinity as well as an analysis over the direct impact generated by the operation of the incinerator:

CET Arad

This company develop activities classified as it follows:

,, combustion installations with a nominal thermal power exceeding 50 MW "

,, hazardous waste disposal plants with a capacity exceeding 50 tones waste / day "

CET Arad capabilities are:

• IMA 1 - existing large combustion plant type I – thermal power of 403 MWt-;TYPE CR 1244

• IMA 2 - existing large combustion plant type I - thermal power 160 MWtcomposed of the two industrial steam boilers. Each generator can produce a steam output of 100 t / h (80 MW thermal power - the boiler 1; 80 MW - boiler 2).

Table 2 Emissions Ceilings (tone/year) cf AIMNo. 10 from 25.10.2006 Revised in 11.08.2011

	2007	2008	2009		2010	2011	2012	2013
Powders	354	354	352		176	176	176	176
SO_2	10890	10890	10890		10890	10890	10890	1852
NO_x	1555	1555	933		933	933	933	933

Sources and pollutants

During achieve the objective

- **Sources of air pollution**

At this stage there will be only mobile pollution sources not stationary sources.

Sources of air pollution during incinerator siting making and construction machinery and mobile are the transport undertaking the works:

Transport constituents of mobile construction

- transport elements of the incinerator
- loading - unloading components of mobile construction and incinerator
- anchor building foundations (bearing blocks)
- mounting incinerator
- Installation of mobile

Equipment and means of transport to be used are:

- crane
- cars, trucks heavy
- cars, trucks lowtonnage

All of them are equipped with diesel engines. Pollutants features are made up of:

- Sulf dioxide
- carbon monoxide
- Nitrogen oxides
- persistent organic pollutants (POPs)
- heavy metal compounds (in particular cadmium) in the exhaust gas

- **Concentrations and mass flow of pollutants discharged**

The type and volume of work that will be performed throughout the building location and mobile incinerator are:

- handling of the components of construction cranes and mobile components of the incinerator (approx. 40 hours running crane)
- Materials transport for construction of foundations anchor and transportation components of mobile construction and parts of the incinerator. It will carry about. 50 t with a number of approx. 10 races.

Mass flow of pollutants will be discharged with the exhaust gases from agricultural and vehicles used were calculated according to the methodology for calculating contributions and taxes owed to the Environment Fund approved by O.M. no. 578/2006, according to:

- the type and capacity of the equipment
- the type of fuel used and its sulfur content
- fuel consumption per machine / vehicle
- operating mode
- operating conditions

Diesel fuel will be used which has a maximum sulfur content of 0.2%

The calculation formula is:

They = EFI x Ni x CCi

where: Ei = mass flow of pollutant

EFI = pollutant emission factor and the class corresponding to the machine / vehicle

Ni = number of vehicles in that category

CCi = specific consumption of oil to the category of equipment / vehicle (it must be converted to kg depending on the density of the fuel used - for diesel d = 820 -845 kg / m³ (density at 15 ° C)

<u>SO_2 emission calculation:</u>

ESO_2 = Ks x C (in kg)

Where:

E SO_2 - emission of SO_2

KS - S content of the fuel, expressed in relative weight (kg / kg); gas oil used = 0.002 KS

C - Fuel Consumption (kg)

Factors emission heavy duty diesel vehicles (> 3.5 T) - diesel

Tabel 3

	NO_X	CH_4	VOC	CO	N_2O	CO_2
Control moderate fuelconsumption of 30.8 l / 100 km						
total g/km	10,9	0,06	2,08	8,71	0,03	800
g/kg combustible	42,7	0,25	8,16	,34,	0,12	3138
g/MJ	1,01	0,00	019	0,80	0,003	73,9

For all activities to be carried out is estimated diesel consumption approx. 700 l, a total number of hours the equipment and the vehicles approx. 50, time average consumption of 15.4 l / h / equipment - the motor vehicle and a number of such machines 4 (1 and 3 transport crane). In this case we have:

A. Debite hourly mass of pollutants resulting from all sources in the event of their co-operation:

The average consumer equipment zone = 4 x 15.4 l / h / machine = 91.6 l / hr = 76.03 kg / h (d = 0.830 kg / l).

Tabel 4

	Mass flow (g/h)						
	NO_X	CH_4	VOC	CO	N_2O	CO_2	SO_2
FE g / kg fuel	42,7	0,25	8,16	34,2	0,12	3138	2
Total emissionsall sources	3246	19	620	2600	9	238583	152,06

B.Total emissions Lifetime Achievement location of the incinerator and civil engineering:

The estimated total consumption of diesel fuel = 700 l = 581 kg (d = 0.830 kg / l)

Table 5

	Mass flow (g/h)						
	NO_X	CH_4	VOC	CO	N_2O	CO_2	SO_2
FE g / kg fuel	42,7	0,25	8,16	34,2	0,12	3138	2
Total emissionsall sources	24,80	0,14	4,74	19,87	0,07	1823,18	1,162

Considering the following aspects:

- actually mass flow rates of these pollutants are much lower because the machines will not work never all together
- the exhaust gas pollutants discharged to diffuse freely into the atmosphere

dispersing conditions at the site are considered very good

- quantities of dust produced during execution and transport are very low as the site of analysis will work only on the concrete platform and the motor will run only on concrete or asphalt roads

it is estimated that the environmental pollution generated by the air factor at this stage, will be insignificant and will not create discomfort.

During the operations target

- Sources of air pollution

Activities that generate air pollution sources call related to:

- burning fuel (diesel oil) in incinerators
- traffic site (site entry and exit of vehicles carrying waste for disposal on site, raising ash and waste from the site, domestic)

- Characterization of sources of air pollutants related to the objective

a) *incinerators to be located within the target*

Follow analyzed on site to place the incinerator type I8-1000 (the project one - the one analyzed in this paper) and type incinerator I8-40A (the project 2 - which runs in parallel with this project but capacity is very small and not intended for incineration of hazardous waste). Also on-site incineration operate a hazardous waste incinerator A2600 type is authorized.

Incinerator type I8-1000

It works with diesel fuel and time consumption will be 47 l / h for a volume of gas resulting from the combustion of 0.79 m3 / h plus air introduced by the forced air supply system.

The incinerator has a flue gas chimney of a height of 6.26 m and a square cross section of side 0.4 m ($S_{evacuation}$ = 0.16 m2).

Source falls into the category of plant sources routed to control pollutants (retaining emissions). In

this type I8-1000 incinerator is equipped with scrubbing Venturi type hydrocyclone.

Incinerator type I8-40A

This diesel-powered and will have a time consumption of 9 l / h for a volume of gas resulting from the combustion of 0.15 m^3/ h plus air introduced by the forced air supply system.

The incinerator has a flue gas chimney of a height of 4.2 m and a diameter of 0.3 m.

Source routed sources falls into the category with facilities to control pollutants (retaining emissions).

b)*Operating incinerator authorized under Objective*

Incinerator type A2600

It works with diesel fuel and time consumption will be 11 l / h for a volume of gas resulting from the combustion of 0.185 m3 / h plus air introduced by the forced air supply system.

The incinerator has a flue gas chimney of a height of 4.25 m and a diameter of 0.3 m.

Source routed sources falls into the category with facilities to control pollutants (retaining emissions).

To determine the flow of exhaust gas chimneys burners below will illustrate the calculation:

The conditions in the combustion stoichiometric refers to quantitative ratios of the constituent elements of the fuel and air.

In laboratory conditions, with exact measurements and controlled conditions can speak stoichiometric with an exact calculation of the mass ratio of the elements. Under normal operation, this is impossible.

Source of energy in any fuel is carbon. At the fuels there are other elements that affect the combustion, and N, S, H_20.

For different types of fuel there is a relation between the amount of atmospheric air (20% O_2) consumed for combustion of fuel kg.

Report for diesel is 14.6.

Calorific value per one liter of diesel fuel is 8250 kcal / h

1 kg = 1,176 liters diesel

1 kg air = 0.77 m^3

One kg of diesel fuel are required 11.22 Nm^3 air per liter of diesel oil and about 9.5422 Nm^3 of air.

These are the theoretical stoichiometric conditions.

In practice, the phenomenon of conversion has an efficiency of 100%, so that the burner manufacturers offer the possibility of adding an excess of air. At most it is up to 100%.

In view of all these data we can calculate the flow rates of the flue gas (which take into account the additional intake of air provides the oxygen needed for combustion) to the 3 incinerators discussed above (all calculations are expressed under normal conditions of pressure and temperature - 273.15 K, 101.325 kPa)

1.incineratorul I8-1000

47 x 14.6 x 0.77 + 100% = 1056.75 Nm^3 / h

2.incineratorul I8-40A

9 x 14.6 x 0.77 + 100% = 202.36 Nm^3 / h

3.incineratorul A 2600

11 x 14.6 x 0.77 + 100% = 247.32 Nm^3 / h

The literature says that an incinerator should ensure min. 6% excess oxygen.

It follows that for each kilocalorie is need to ensure

9542/8520 = 0.0011971 m^3 of air.

Given these data incinerators are equipped with equipment to provide additional air for combustion, depending on the capacity of the primary combustion chamber. Thus we have the following situations:

- I8-1000 incinerator is equipped with additional injection system has (turbine) whose operation is controlled by the automated and computerized control and combustion temperature. At the same time the injectors have also comprises turbochargers provide an increased flow of air required for a complete combustion which they areall controlled automatically. This system provides a surplus of air between 2000 and 3000 Nm_3 / h. The average hourly rate in this case will be:

1056 + 2500 = 3556 Nm_3 / h

- I8-40 ° incinerator incinerator and 2600 have provided the additional air turbines that are mounted directly on the burner which are controlled by the automation system

Also it can calculate the total annual emissions of greenhouse gases that will result from the operation of the incinerator and other incinerators I8-1000 type:

- type incinerator I8-1000 = 194.3 tCO2 / year
- type incinerator I8-40A = 76.5 tCO2 / year
- incinerator A2600 = 102 tCO2 / year

- Total GHG emission = 327.8 t CO2 / year

c) *Trafficking site*

This is represented by:

- entry and exit of vehicles transporting waste for disposal by incineration
- entry and exit of vehicles transporting wastewater from the treatment plant cesspools of Arad
- entry and exit of vehicles transporting waste generated on site
- domestic waste handling activity

Hazardous waste transport is by vans of company equipment (5 vans allowed).

Transportation of hazardous waste from the generator location is analyzed by authorized vehicles in the endowment generators with authorized vehicles leased from third parties, using approved containers in the endowment generators.

Considering the company's work previously endowment 2 pieces of new incinerators and expanding after startup of the incinerator type I8-1000 is expected to be achieved by 1 stroke / day 3 vans and 3 flights / day.

The specific consumption of gas oil used in the transport of commercial vehicles, on average, 17 liters at 100 km.

The fork lift truck working on average 4 hours / day, with a daily work schedule according to the random and has a consumption of 6 l / h.

Mass flow of pollutants discharged into the atmosphere with exhaust fumes from vehicles, and equipment used in site traffic were calculated according to the methodology for calculating contributions and taxes owed to the Environment Fund, approved by Order no. 578/2006 with subsequent amendments and supplements.

Pollutants emitted are formed from the powder, sulfur dioxide, carbon monoxide, nitrogen oxides, persistent organic pollutants (POPs), heavy metal compounds (mainly cadmium). These pollutants were calculated with the same formula as in the calculation of emissions of pollutants from machines and motor transport means used during the implementation phase of the project.

Taking into consideration working program and calculated the average hourly mass flow of the resultant pollutants. The values obtained are presented in the table below:

	The average mass flow(g/h)

	NO_x	SO_2	PM	POP	Cd
Allsources	118,3	2,07	19,6	0,0098	0,000028

Sources are unguided or contaminated, air is not taken and discharged through an exhaust system. In this case I can not calculate the concentrations of pollutants in the air. Pollutants are discharged with the exhaust gases to diffuse freely into the atmosphere. The conditions for dispersion at the site to be analyzed are very good.

By analyzing the mass flow of pollutants discharged into the atmosphere it can be concluded that this source of pollution is significant, the more so if compared with the quantities of pollutants on thoroughfares (in this case the belt Arad, in the vicinity of the objective of the analysis).

- **Concentrations and mass flow of pollutants discharged into the atmosphere**

For stationary sources routed

As specified in the technical books of incinerators equipped with burners ECOFLAM, compared with average values according to European standards for pollutants emitted into the atmosphere we have the following have values:

Table 7: Average Emissions Standards EU and the base of incinerators (the secondary compartment)

Parameter	Standard values	Measurement data type incineratorI8-1000
Solide Particles	30 mg/m³	1,2 mg/m³
Sulf Dioxide	200 mg/m³	2,4 mg/m³
NitrogenDioxide*	400 mg/m³	60 mg/m³
Carbon monoxide	100 mg/m³	78,3 mg/m³

For mobile sources

The observation unit is equipped with five special vehicles equipped with diesel engines with a

capacity less than 3,5 T, having an average of 11.5 / 100 km or 8 l / hour.

According to the specific activities to be carried out on site analyzed the busiest on the concurrent operation of the truck engines and special vehicles, includes:

- the existence of a maximum of 2 special engines that present on the site started simultaneously;
- their co-operation within 2 hours / day;
- the maximum hourly consumption (heat of combustion engines trucks) of diesel per site 16 l;
- the operation of the fork lift truck 1 hour maximum trucks overlap with the operation of engines at a rate of 6 l diesel ;
- the maximum hourly consumption (combustion heat engines of trucks + forklift engine) of diesel per site 16 + 6 = 22 l / h;

The centralized data source of pollutants emitted from stationary and mobile sources are routed shown in the tables below:

Table 8: stationary pollution sources directed

Title of the Source	**Polutant**	**Mass Flow (g/h)**	**Gass flow rate Air contaminated (m^3/h)**	**Concentration in the emisson (mg/m^3)**	**Alert threshold (mg/m^3)**	**VLA[1] (mg/m^3)**
incinerator flue gas chimney I8-1000	NO_x	200	3556	60	245	350
	SO_2	8,53		2,4	24,5	35
	CO	278,43		78,3	70	100
	Particles	4,26		1,2	3,5	5
	COV	38,3		10,77	n.n.	n.n.

[4] Reference conditions T = 273 K, P = 101.3 kPa, dry gas, oxygen content 11%

Table 9: mobile pollution sources

Source		Mass Flow (g/h)						
		NO_X	CH_4	VOC	CO	N_2O	CO_2	SO_2
	FE g / kg fuel	15,9	0,055	4,64	1,58	0,188	3138	2
	diesel fuelconsumption per hour l / h - kg / h							
trucks	16 – 13,6	216,24	0,74	63,1	21,48	2,55	42676,8	27,2
forklift	6 – 5,1	81,09	0,28	23,66	8,05	0,95	16003	10,2
Total	22 – 18,7	297,33	1,02	86,76	29,53	3,5	58679,8	37,4

Table 10: stationary sources of air pollution emitted pollutants and generated

Title of Activity	**Sources generating atmospheric pollutants**					**Physical characteristics of sources**			**Parameters of exhaust gases**		
	Name	Diesel consumption l/h	Annual working time hours	Pollutant	Quantities of genratedpollutants t/an	Name	High m	The inside diameter (area) of the top of the chimney m^2	Velocity m/s	Temperature °C	volume flow m3 / s mass flow g / s
Waste Incineration	Incinerator Type I8-1000	47	9,5 h/day x 320 days /year = 3040 h/year	NO_x	0,608	Shopping flue gas	6,24	0,16	6,17	250	0,98 – 0,055
				SO_2	0,026						0,98 – 0,0023
				CO	0,845						0,98 – 0,077
				Particles	0,013						0,98 – 0,0012
				COV	0,115						0,98 – 0,011

Predicting air pollution

During the works for the project

Evaluation of the environmental impact of the air factor for this step is made in terms of emission

concentrations (concentration of pollutants in the breath).

They are important only in the short term to correct concentrations (or 1 hour) representing the highest concentrations due likely to respiratory sources that operate simultaneously in the same area. Consequently only interested in the concentrations of nitrogen oxides and sulfur dioxide OM 592/2002 established that the maximum allowable limits for the cure time of one hour. Determination of the concentration of pollutants in the emission is done by modeling of the dispersion of pollutants.

The results obtained in relation to the maximum allowable concentrations are shown in the table below:

Source	Pollutant	$C_{maxim\ 1\ h}$ ($\mu g/m^3$)	$CMA_{1\ h}$ ($\mu g/m^3$)
All sources	NO_x	103,1	200
	SO_2	1,53	350

It is noted that peak values emission term remediation (one hour) of pollutants resulting from the operation of machines and the vehicles carrying out transport and installation work and construction incinerator I8-1000 phones are much lower than the maximum permitted levels and recorded at a distance of 20 m from the source and only under certain climatic conditions (absence of air currents, excessive heat, etc.) and in any other weather conditions emission concentrations are lower. At the same time the concentrations of the emission are increasingly smaller as the distance from the source increases.

During operating the facility

- The dispersion of pollutants in the air, the maximum area of influence and qualitative changes occurred

Calculation of the emission concentrations were made only for the source considered significant (I8-1000 incinerator) by mathematical modeling of the dispersion of pollutants.

Emission concentrations determined values relate to the maximum allowable provided by the OM Law 462/1993 104/2011 read in conjunction with the changes and additions.

To determine the fields of emission concentrations of pollutants discharged into the atmosphere from sources associated with the operation target was used a Gaussian model, namely climatological model based on model theory and Tikvart Martin.

This is a model for the estimation of the long-term pollutant sources continue mediation point or area.

The fundamental physical basis of this model is the assumption that the spatial distribution of the Gaussian is given by the concentration of the wedge.

The concentration of the long-term average

The average concentration of that in a receiver of a remote source R and the height z above the ground is given by:

$$\overline{C}_A = \frac{16}{\pi}\int_0^{\infty}\left[\sum_{k=1}^{16} q_k(\rho)\sum_{l=1}^{8}\sum_{m=1}^{7}\Phi(k,l,m)S(\rho,z;u_l,P_m)\right]d\rho$$

where:

k = index for the wind direction

q k (ρ) = ∫Q (ρ,θ) d for the k

Q (ρ,θ) = the emission of the source per unit of time of the surface

ρ= Distance from the receiver to a source of infinitesimal surface

θ= Angle in polar coordinates centered on the receiver

l = index for the wind speed class

m = class stability index

Φ(K, l, m) = function of the frequency of weather conditions

S (z, Ul, Pm) = function that defines dispersion

z = height above ground receiver

ul= the wind velocity representative

Pm = class stability

For point sources, the average concentration in CP due to a number **n** of sources, is given by:

$$\overline{C}_P = \frac{16}{2\pi}\sum_{n=1}^{N}\sum_{l=1}^{8}\sum_{m=1}^{7}\frac{\Phi(k_n,l,m)\ G_n\ S(\rho_n,Z;u_l,P_m)}{\rho_n}$$

where:

- kn = **n** the wind to the source
- Gn =Emission source **n**
- ρ_n = distance from the receiver to the source of **n**

If the receiver is on the ground (respiratory), then z = 0 and function form S (z; ul, Pm) will be:

$$\overline{C}_P = \frac{16}{2\pi} \sum_{n=1}^{N} \sum_{l=1}^{8} \sum_{m=1}^{7} \frac{\Phi(k_n, l, m)\ G_n\ S(\rho_n, Z; u_l, P_m)}{\rho_n}$$

ifsz(r) < 0,8 L and

$$S(\rho, 0; u_l, P_m) = \frac{2}{\sqrt{2\pi} u_l \sigma_z(\rho)} \exp\left(-\frac{0.692}{u_l T_{1/2}}\right) \exp\left(-\frac{H^2}{2\sigma_z^2}\right)$$

if$\sigma_z(\rho)$> 0.8 L

where:

$\sigma_z(\rho)$ = function of the vertical dispersion, for example, the standard deviation of the concentration in the vertical plane

h = height of the effective source

L = height of the mixture in the afternoon

T1 / 2 = half-life of the pollutant.

Possibility disappearance by physical or chemical pollutant is given by the expression:

exp (-0.692 /uıT1 / 2).

The total concentration for a given period of mediation sum of the concentrations due to all sources for that period.

The input data include information on:

Grid computing - The model allows the calculation of the average concentration of the pollutant at any point at a distance from the source / sources, by taking into account the contribution of all the sources. As a result, it is possible to calculate the concentrations in an area around the source. To this end, delimitedarea of interest, and its surface is fixed grid, usually square, whose vertical are receptors. Number of nodes and scale up will be selected according to characteristics of the source area of concern

and issues that need to be answered. The grid will have a home and a coordinate system with the x axis and y-axis east to the north, by establishing the coordinates of sources and nodes.

Emission data source characteristics comprising: geometric height, diameter or area of the emission rate and the exhaust temperature of the pollutants.

Meteorological parameters are introduced in the form of frequency function (k, l, m) of the triple wind direction, wind speed class and the class of stability, the long strings of data set (multi-annual).

For example, if working on 16 sectors of wind speed and 8th grade 7 classes of stability, function table of frequency values comprises 896 entries.

The concentrations of the specific target pollutant sources have been made in a quadratic grid sizes of 0.8 km x 1.0 km to step 10 m, with sources in the center.

The maximum concentration of short duration

To assess the short-term concentrations in the medium was used a model by the Gaussian type more suitable than its climatology conditions (which sometimes undervalued sector by averaging the short-term concentrations).

The model uses as input the characteristics of the emission of pollutants (the amount of pollutants discharged into the atmosphere per unit of time, the height of the exhaust temperature and velocity of the exhaust gas) and the meteorological factors decisive in the distribution of pollutants: wind speed, the degree of thermal stratification of atmosphere.

The relationship for calculating the concentration of the pollutant at a point is:

$$C(x,y,z) = \frac{Q}{\pi u \sigma_y \sigma_z} \bullet \exp\{-\frac{y^2}{2\sigma_y^2}\} \bullet \exp\{-\frac{H^2}{2\sigma_z^2}\}$$

where:

Q - the emission of pollutants in g / s

H - the actual height of the source, depending on the temperature and the speed of the exhaust gas, the inside diameter at the top and the stack height

u - source height wind speed

□y, □z - dispersion parameters depending on the class stratification of the atmosphere, the distance from the source and the environment in which the emission takes place (urban / rural).

Excess feathers of pollutants, the decisive parameter in evaluating the pollutant concentration at a certain distance from the source, was determined by the formula of Briggs corrected for stratification of

the atmosphere stable. Dispersion parameters y and z were determined by the formulas recommended by WMO 1982.

Calculations were performed on axis wind situation where concentrations are the highest values for all possible weather conditions.

For assessing the level of toxic emissions resulting from the operation of the incinerator-type I8-1000 theoretical calculations have been made for the emission of pollutants according to the use and type of fuel used, the calorific value, the temperature of the exhaust gases and emissions factors.

Calculation was carried out to a calorific value of the fuel used (diesel 11,872 kWh / kg (42 MJ / kg - lower calorific value of fuel). The combustion source is composed of burner fuel cell and afterburner. Removal of combustion gases is after passing through the washing plant, passed through the drain basket (D = 0.4 m; H = 6.24 m). Bearing in view of the equipment for flue gas desulfurization of combustion (Venturi and hydrocyclone washing installation) (sulfur <10 ppm, cf. leaflet) factor emission of sulfur oxide can be calculated based on the sulfur content of fuel, using the formula:

FE SO_2 = [S] x 20,000 / CVNet (Corinair 2013 1.A.1- Cap.6.3.2) in which:

- FE SO_2 - SO_2 emission factor (g / GJ)
- [S] - fuel sulfur content (% w / w) oil contains sulfur <10 ppm, a density of 8.350 kg of gas oil / m3, a sulfur content of 0.0002% (% by weight)
- CVNet - fuel lower heating value (GJ / t net) = 42 GJ / t

FE_{SO2} = 0.120 g / GJ <compared to diesel emission factor determined in Corinair 2013 Tab.3.3; 1.A.2 to 0.67 g / GJ.

For safety assessment calculation for the emission concentrations have been made for the emission factor disadvantage.

In order to calculate the concentrations of combustion gases from the combustion of fuel in the incinerator and to take into account the following aspects:

- gaseous emissions resulting from combustion chamber where fossil fuels are converted into heat + combustible materials consisting of:

nitrogen - 78% of the air introduced into the enclosure, which does not take part in combustion

CO_2 - the result of oxidation of carbon (which is the source of thermal energy in the process)

H_2O - the result of hydrogen combustion.

And determining the amount of components and airflow compounds

Below, a theoretical calculation is made exclusive for the combustion of fuel

The gas oil composition have two main elements, namely 86% carbon, 12% hydrogen and some side elements, of which only one is notable 0.003% sulfur.

Carbon is oxidized and resulting CO_2

$C + O_2 \rightarrow CO_2$

If we introduce molecular weight, we have:

$12 + 32 \rightarrow 44$

This means that carbon 12 kg of 32 kg of oxygen are required to provide 44 kg of CO_2.

In our case we have 1 kg of fuel, resulting in:

$0.85 + 2.27 \rightarrow 3.12$

So, there are 2.27 kg of oxygen necessary for the combustion of one kilogram of carbon in the fuel (diesel oil)

Hydrogen is oxidized and resulting H_2O

$2H_2 + O_2 \rightarrow 2H2O$

If we introduce molecular weight:

$4 + 32 \rightarrow 36$

In our case we have 1 kg of fuel resulting in:

$0.12 + 0.96 \rightarrow 1.08$ kg

So, there are 0.96 kg of oxygen necessary for the combustion of hydrogen in the fuel kilogram.

And the resulting sulfur oxidizing SO_2

$S + O_2 \rightarrow SO_2$

If we introduce molecular weight, we have:

$32 + 32 \rightarrow 64$

In our case we have 1 kg of fuel, resulting in: $0003 + 0003 \rightarrow 0006$

All masses summarized H + S+ C + (2.17 + 1.08 + 0.006) 3.236 kg result of the combustion of oxygen required for 1 kg of gas oil.

Since the oxygen is present in air in a concentration of 21%, the determination is made

3.236 ÷ 0.21 = 15.4 kg of air.

Under normal conditions, the air has a density of 1.3 kg / m^3, so we need 20 m^3 of air per kg of fuel or 16, 6 m^3 per liter.

These are the stoichimetrice. In the process of combustion in excess air will always be 20%.

When the calculation is made from the flue gases will take account of nitrogen, which do not suffer notable changes in the combustion process, i.e., the amount will be equal to the process with the resulting, i.e. 0.78 of the total volume.

The above phenomena occurring under theoretical laboratory. In practical applications have been two phenomena:

- a small part of the nitrogen and oxygen will combine with the nitrogen oxides will result - NOx
- a small part of the carbon to form CO (because not all of the combustion speed of the C atoms will receive two O atoms)
- it takes into account the fact that H 2 O (resulting from the oxidation of hydrogen) is in the gaseous state (0.8 kg / m3)

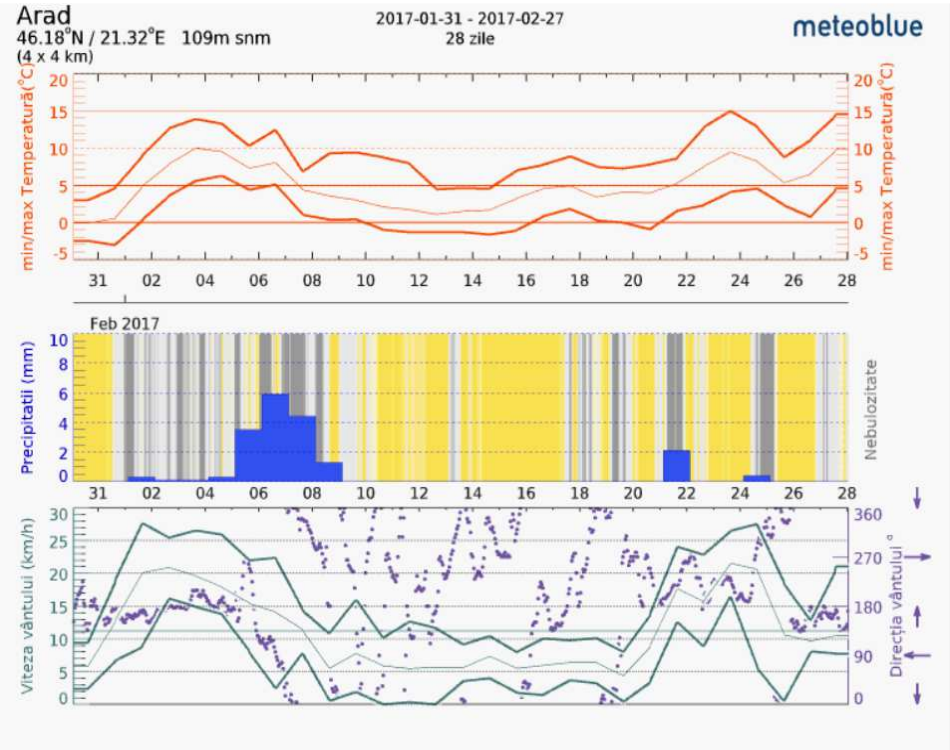
Calculation of concentrations of NOx in the flue gas emission, is introduced centrally in the table below:

No	Parametres	UM	Value	Observations
1.	Excessaircoefficient λ = theratio of the actual amount of airsupplied for combustionandtherequired minimum amount, λ = Lr / Lmin		1,7	
2.	The theoretical volume of dryair - V_a	Nm^3/l	16,6	
3.	Real volume of aer	Nm^3/l	28,22	
4.	The theoretical volume nitrogen $V_{N2} = 0,79\ V_a + N_2/100$	Nm^3/l	13,11	
5.	Flue gas volume Triatoma$V_{RO2} = 0,01\ (CO_2 + CO + H_2S +$ sum. $C_mH_n)$	Nm^3/l	1	
6.	Theoretical volume of dry gas$V_{gU} = V_{N2} + V_{RO2}$	Nm^3/l	14,11	
7.	The theoretical volume of water vapor$V_{H2O} = 0,01\ (CO_2 + CO + H_2S$	Nm^3/l	1,98	

	+ sum. $C_mH_n n/2 + 0,124) + 0,0016 \lambda$			
8.	The theoretical volume of thecombustion gas$V_g = V_{gU} + V_{H2O}$		16,09	
9.	The actual volume of dry gas $V_{gU} = V_{gU}^o + (\lambda -1) V_a^o$		25,73	
10.	The actual volume of water vapor $V_{H2O} = V_{H2O} + 0,016 d (\lambda -1) V_a^o$		2,16	
11.	The actual volume of gases$V_g = V_{gU} + V_{H2O}$		27,89	
12.	Fuelconsumption	l/h	47	
13.	Gas temperature at theoutlet of basket	^oC	250	
14.	Total gas flow$Q_g = V_gB (273 + T_g)/273$	m^3/s	0,988	3556 m^3/h
15.	Dispersiondiameter cart D	m	0,4	
16.	Heightbasketdispersion H	m	6,24	
17.	Gas exhaustsurface S_g	m^2	0,16	
18.	The exhaust gas velocity$W_g = Q_g/S_g$	m/s	6,175	
19.	**The concentration of thepollutant (calculated)**			
	NO_x	mg/m^3	60	
	CO	mg/m^3	2,4	
	Particles	mg/m^3	78,3	
	COV	mg/m^3	1,2	
	SO_2	mg/m^3	10,77	
20.	**The quantity of pollutantemitted**			
	NO_x	g/s	0,055	
	CO	g/s	0,77	
	Particles	g/s	0,0012	
	COV	g/s	0,011	
	SO_2	g/s	0,0023	
21.	The averagewindspeed at the top of thechimneyFebruary 2017	m/s	11,2	
22.	The annualaveragewindspeed at the top of thebasket	m/s	2,45	
23.	Averagewindspeed in theareaanalyzedFebruary 2017	m/s	11	
24.	The averagewindspeed in theanalyzedarea	m/s	2,4	
25.	PumpingchimneyFebruary$H_h = 1,5 \times S \times W_g / (V_o \times D)$	m	0,34	
26.	The annualaverage lifting height of thechimney$D_h = 1,5 \times S \times W_g / (V_o \times D)$	m	1,54	
27.	Total lift heightfumeFebruary	m	7,78	
28.	The total height of lift of theexhaust gas (annualaverage)	m	6,58	

To draw diagrams dispersion of air pollutants was conducted in February 2017 month study taking

into account wind speed and direction [Archive Weather Arad - Meteoblue Weather], temperature and cloud cover.



Temperature, relative humidity Including per hour

Clouds (gray background) and clear (yellow background). The bottom is closed, with Greater cloud cover

Wind direction in degrees:

0 ° = North,

90 = east,

180 ° = South

---

[5] Weather archive Arad - Meteoblue weather

270 ° = West

and wind speed. In Meteograms based archive forecast points purple represents the wind direction, as indicated on the right axis.

The calculations and scatter diagrams have been made for the periods with the highest intensity of the wind, and for data 2 and 25 February 2017. In this data was made and a wind speed measurement type with a weather station located in Davis Instruments Vantage Vue analyzed the location of the height of 7 m and

8 m. The values were used in the mathematical modeling program for the dispersion of pollutants.

There have been calculations and mathematical modeling for the days with the highest speed of the wind.

The data used are shown in the table below:

Data	Rangedetermination	Wind speed (km/h – m/s) Direction				Temperature °C	Nebulosity
		SE	NV	SSE	SW		
02.02.2017	13 - 15			21 / 5,8		9	50 % cloudy
06.02.2017	12 – 14	11 / 3				7	60 % rain
23.02.2017	13 – 14	17 / 4,7				10	Clear sky
25.02.2017	14 – 15		27 / 7,5			13	100 % cloudy

For 2nd of February 2017

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: March 1, 2017  2244 hours ST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: NITROGEN DIOXIDE
  CAS Number: 10102-44-0                Molecular Weight: 46.01 g/mol
  AEGL-1 (60 min): 0.5 ppm   AEGL-2 (60 min): 12 ppm   AEGL-3 (60 min): 20 ppm
  IDLH: 20 ppm
  Ambient Boiling Point: 20.8° C
  Vapor Pressure at Ambient Temperature: 0.55 atm
  Ambient Saturation Concentration: 561,354 ppm or 56.1%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 5.8 meters/second from sse at 7 meters
  Ground Roughness: open country        Cloud Cover: 5 tenths
  Air Temperature: 9° C                 Stability Class: D
  No Inversion Height                   Relative Humidity: 50%

SOURCE STRENGTH:
  Direct Source: 0,055 grams/sec        Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 3.3 kilograms/min
  Total Amount Released: 198 kilograms

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (20 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: 137 meters --- (12 ppm = AEGL-2 [60 min])
  Yellow: 1.0 kilometers --- (0.5 ppm = AEGL-1 [60 min])
```

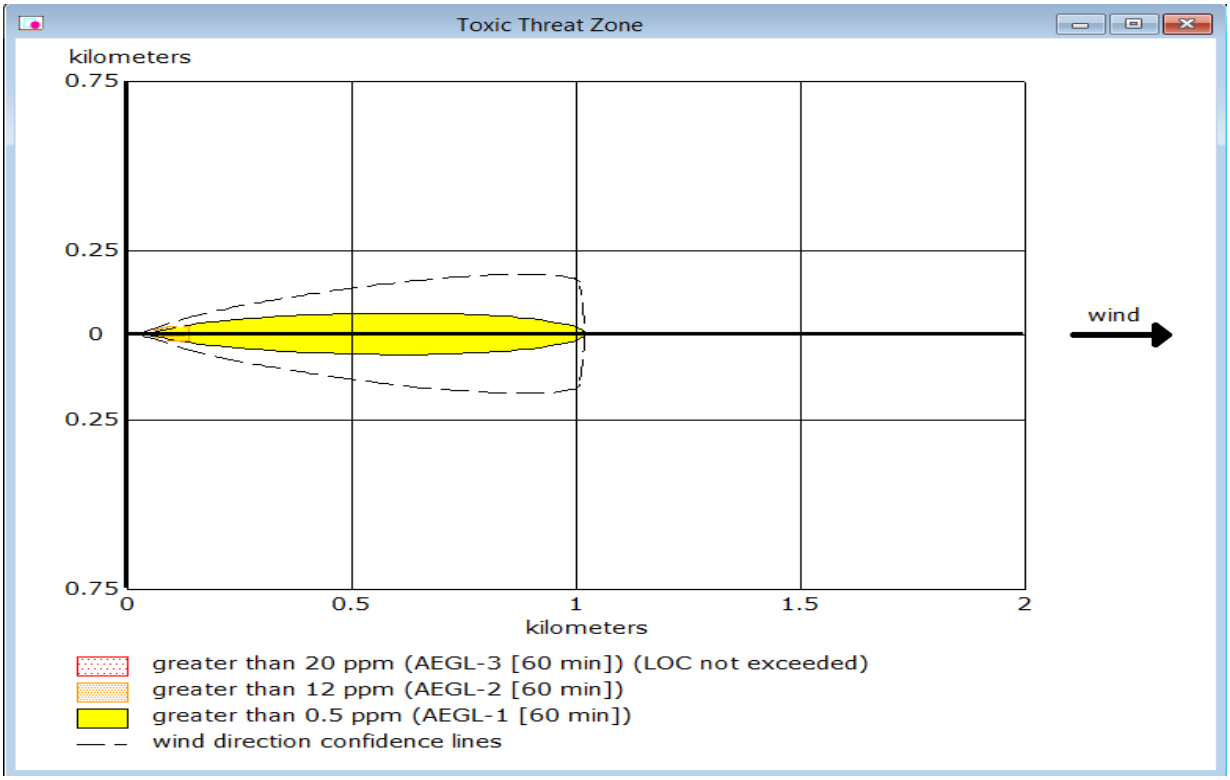
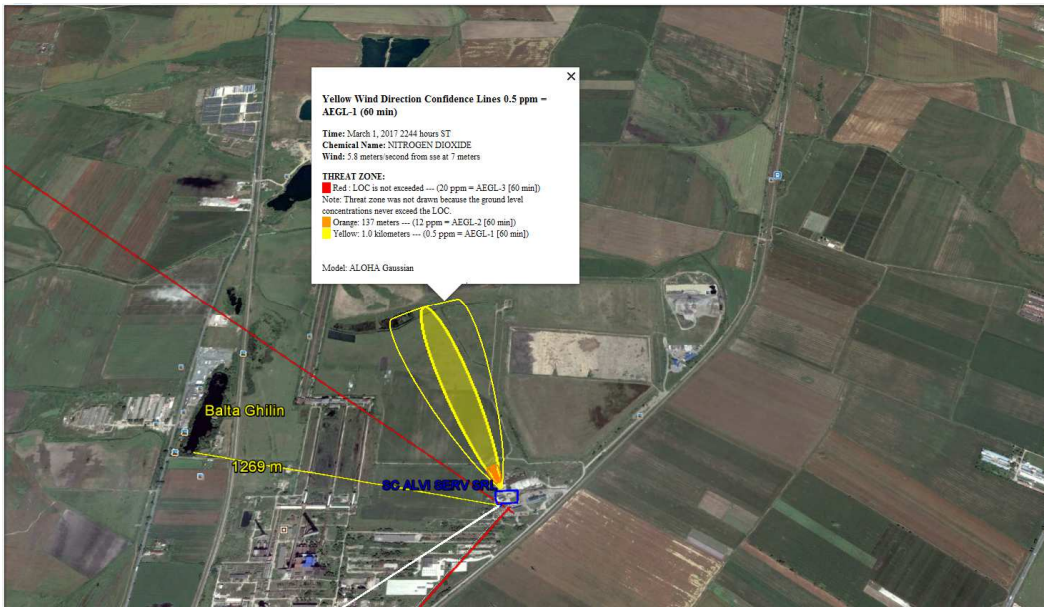


Figure 4: dispersion NO_x



SO_2

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 6, 2017  1205 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: SULFUR DIOXIDE
  CAS Number: 7446-9-5                    Molecular Weight: 64.06 g/mol
  AEGL-1 (60 min): 0.2 ppm   AEGL-2 (60 min): 0.75 ppm   AEGL-3 (60 min): 30 ppm
  IDLH: 100 ppm
  Ambient Boiling Point: -10.3° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 7 tenths
  Air Temperature: 7° C                   Stability Class: C
  No Inversion Height                     Relative Humidity: 70%

SOURCE STRENGTH:
  Direct Source: 0.0023 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 0.138 grams/min
  Total Amount Released: 8.28 grams
  Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (30 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (0.75 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: LOC is not exceeded --- (0.2 ppm = AEGL-1 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
```

CO

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 6, 2017  1205 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: CARBON MONOXIDE
  CAS Number: 630-8-0                    Molecular Weight: 28.01 g/mol
  AEGL-1 (60 min): N/A   AEGL-2 (60 min): 83 ppm   AEGL-3 (60 min): 330 ppm
  IDLH: 1200 ppm     LEL: 125000 ppm     UEL: 742000 ppm
  Ambient Boiling Point: -191.7° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from se at 7 meters
  Ground Roughness: open country         Cloud Cover: 7 tenths
  Air Temperature: 7° C                  Stability Class: C
  No Inversion Height                    Relative Humidity: 70%

SOURCE STRENGTH:
  Direct Source: 0,077 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 4.62 kilograms/min
  Total Amount Released: 277 kilograms
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (330 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (83 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: no recommended LOC value --- (N/A = AEGL-1 [60 min])
```

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 6, 2017  1205 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: NITROGEN DIOXIDE
  CAS Number: 10102-44-0                  Molecular Weight: 46.01 g/mol
  AEGL-1 (60 min): 0.5 ppm   AEGL-2 (60 min): 12 ppm   AEGL-3 (60 min): 20 ppm
  IDLH: 20 ppm
  Ambient Boiling Point: 20.8° C
  Vapor Pressure at Ambient Temperature: 0.50 atm
  Ambient Saturation Concentration: 507,044 ppm or 50.7%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 7 tenths
  Air Temperature: 7° C                   Stability Class: C
  No Inversion Height                     Relative Humidity: 70%

SOURCE STRENGTH:
  Direct Source: 0,055 grams/sec          Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 3.3 kilograms/min
  Total Amount Released: 198 kilograms

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : 111 meters --- (20 ppm = AEGL-3 [60 min])
  Orange: 155 meters --- (12 ppm = AEGL-2 [60 min])
  Yellow: 862 meters --- (0.5 ppm = AEGL-1 [60 min])
```

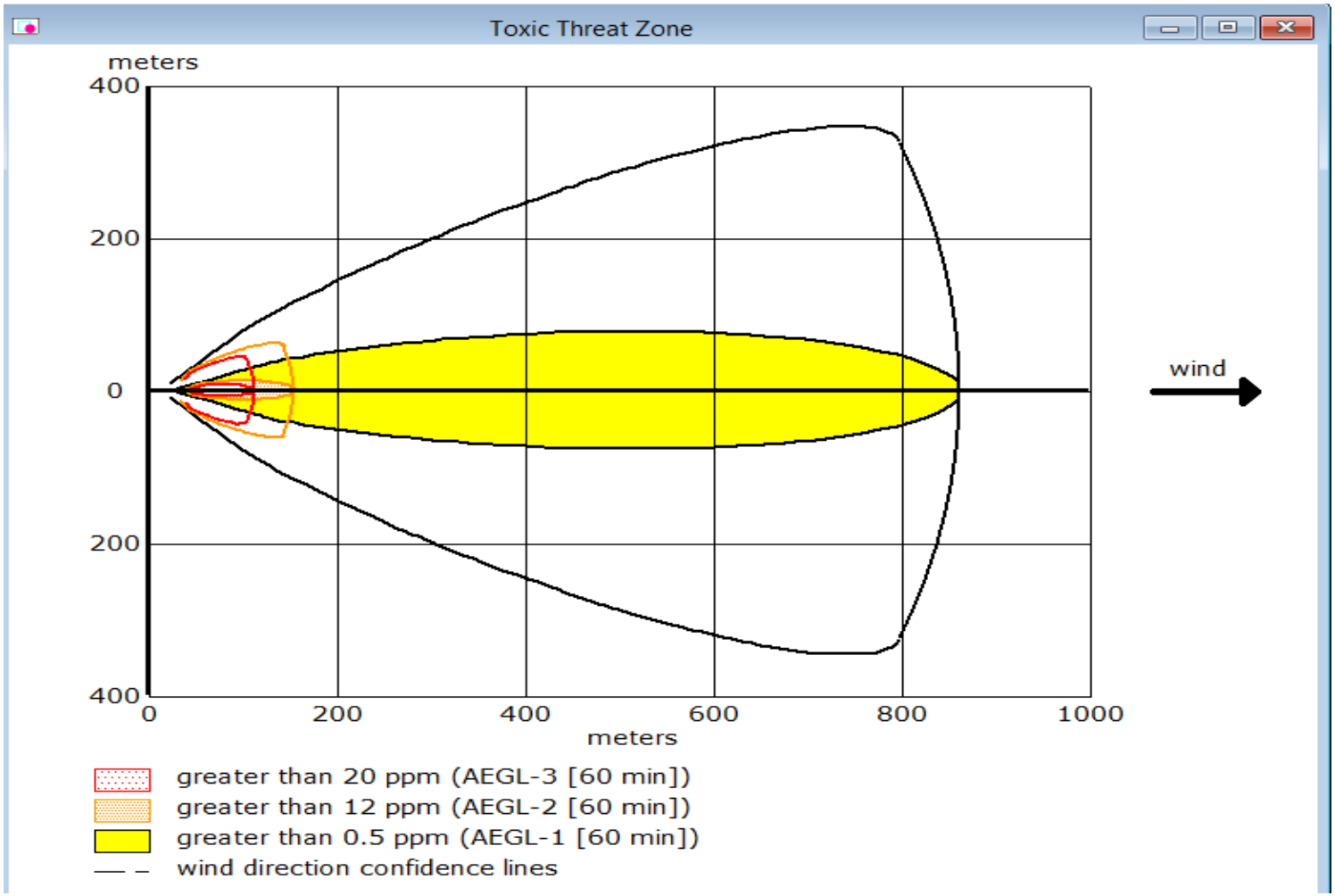


Figure5: $NO_{x\ dispersion}$

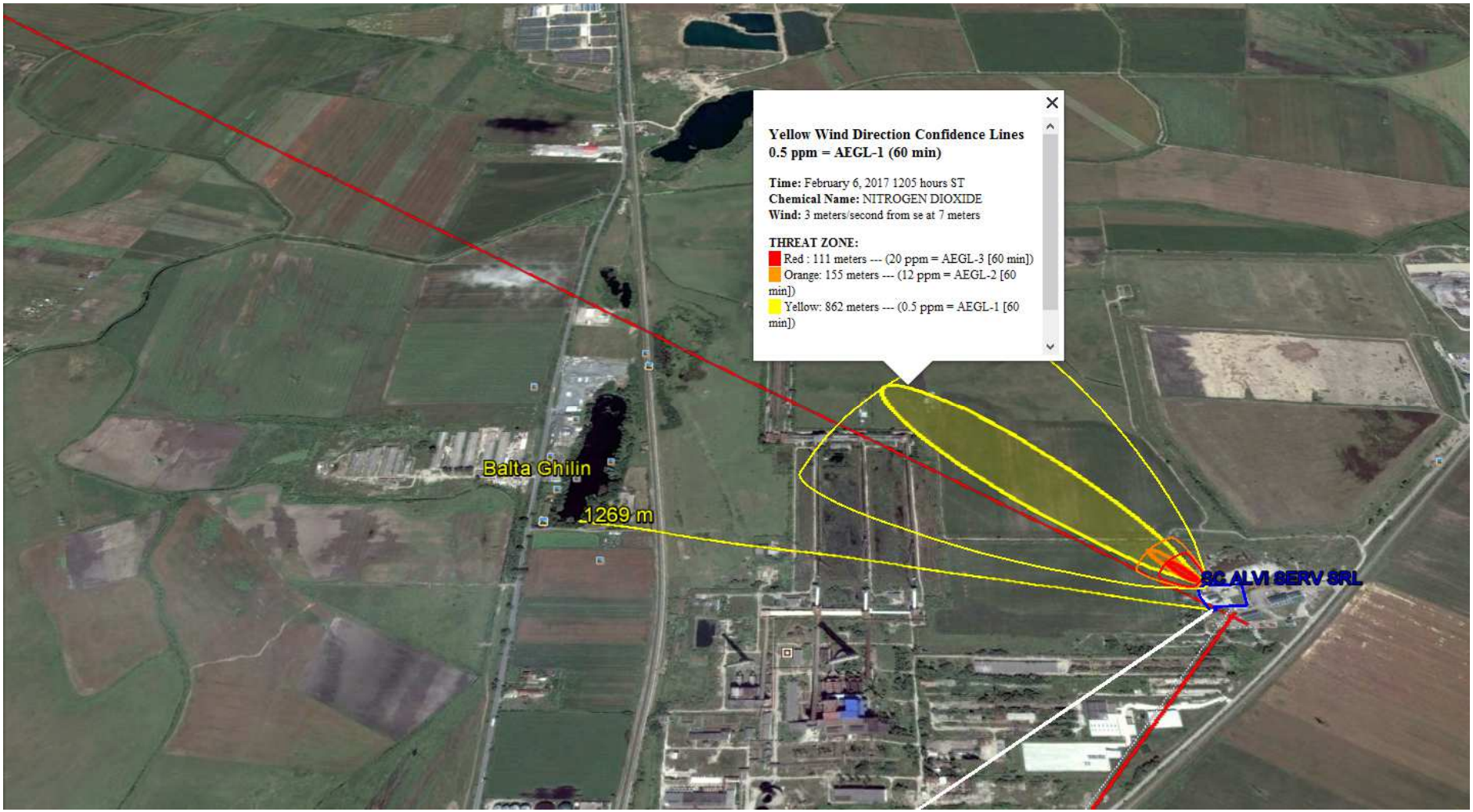


Figure6: $NO_{x\ dispersion}$

SO_2

File Edit SiteData SetUp Display Sharing Help

Text Summary

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 1 (user specified)
  Time: February 6, 2017  1257 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: SULFUR DIOXIDE
  CAS Number: 7446-9-5                    Molecular Weight: 64.06 g/mol
  AEGL-1 (60 min): 0.2 ppm   AEGL-2 (60 min): 0.75 ppm   AEGL-3 (60 min): 30 ppm
  IDLH: 100 ppm
  Ambient Boiling Point: -10.3° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 5 tenths
  Air Temperature: 7° C                   Stability Class: C
  No Inversion Height                     Relative Humidity: 50%

SOURCE STRENGTH:
  Direct Source: 0.0023 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 0.138 grams/min
  Total Amount Released: 8.28 grams
  Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (30 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (0.75 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: LOC is not exceeded --- (0.2 ppm = AEGL-1 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
```

CO

File Edit SiteData SetUp Display Sharing Help

Text Summary

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 1 (user specified)
  Time: February 6, 2017  1257 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: CARBON MONOXIDE
  CAS Number: 630-8-0                     Molecular Weight: 28.01 g/mol
  AEGL-1 (60 min): N/A   AEGL-2 (60 min): 83 ppm   AEGL-3 (60 min): 330 ppm
  IDLH: 1200 ppm     LEL: 125000 ppm      UEL: 742000 ppm
  Ambient Boiling Point: -191.7° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 3 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 5 tenths
  Air Temperature: 7° C                   Stability Class: C
  No Inversion Height                     Relative Humidity: 50%

SOURCE STRENGTH:
  Direct Source: 0.77 grams/sec           Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 46.2 grams/min
  Total Amount Released: 2.77 kilograms
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (330 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (83 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: no recommended LOC value --- (N/A = AEGL-1 [60 min])
```

Pentru data de 23.02.2017

NO_x

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 23, 2017  1315 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: NITROGEN DIOXIDE
  CAS Number: 10102-44-0                  Molecular Weight: 46.01 g/mol
  AEGL-1 (60 min): 0.5 ppm   AEGL-2 (60 min): 12 ppm   AEGL-3 (60 min): 20 ppm
  IDLH: 20 ppm
  Ambient Boiling Point: 20.8° C
  Vapor Pressure at Ambient Temperature: 0.58 atm
  Ambient Saturation Concentration: 590,352 ppm or 59.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 4.7 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 0 tenths
  Air Temperature: 10° C                  Stability Class: C
  No Inversion Height                     Relative Humidity: 30%

SOURCE STRENGTH:
  Direct Source: 0.055 grams/sec          Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 3.3 grams/min
  Total Amount Released: 198 grams

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (20 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (12 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: LOC is not exceeded --- (0.5 ppm = AEGL-1 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
```

SO_2

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 23, 2017  1315 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: SULFUR DIOXIDE
  CAS Number: 7446-9-5                    Molecular Weight: 64.06 g/mol
  AEGL-1 (60 min): 0.2 ppm   AEGL-2 (60 min): 0.75 ppm   AEGL-3 (60 min): 30 ppm
  IDLH: 100 ppm
  Ambient Boiling Point: -10.3° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 4.7 meters/second from se at 7 meters
  Ground Roughness: open country          Cloud Cover: 0 tenths
  Air Temperature: 10° C                  Stability Class: C
  No Inversion Height                     Relative Humidity: 30%

SOURCE STRENGTH:
  Direct Source: 0.0023 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 0.138 grams/min
  Total Amount Released: 8.28 grams
  Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (30 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (0.75 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: LOC is not exceeded --- (0.2 ppm = AEGL-1 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
```

CO

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 60 (user specified)
  Time: February 23, 2017  1315 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: CARBON MONOXIDE
  CAS Number: 630-8-0                    Molecular Weight: 28.01 g/mol
  AEGL-1 (60 min): N/A   AEGL-2 (60 min): 83 ppm   AEGL-3 (60 min): 330 ppm
  IDLH: 1200 ppm     LEL: 125000 ppm     UEL: 742000 ppm
  Ambient Boiling Point: -191.7° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 4.7 meters/second from se at 7 meters
  Ground Roughness: open country         Cloud Cover: 0 tenths
  Air Temperature: 10° C                 Stability Class: C
  No Inversion Height                    Relative Humidity: 30%

SOURCE STRENGTH:
  Direct Source: 0.077 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 4.62 grams/min
  Total Amount Released: 277 grams
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (330 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (83 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: no recommended LOC value --- (N/A = AEGL-1 [60 min])
```

Pentru data de 25.02.2017

NO_x

File Edit SiteData SetUp Display Sharing Help

```
SITE DATA:
   Location: ARAD, ARAD, ROMANIA
   Building Air Exchanges Per Hour: 1 (user specified)
   Time: February 25, 2017  1405 hours ST (user specified)

CHEMICAL DATA:
   Chemical Name: NITROGEN DIOXIDE
   CAS Number: 10102-44-0                 Molecular Weight: 46.01 g/mol
   AEGL-1 (60 min): 0.5 ppm   AEGL-2 (60 min): 12 ppm   AEGL-3 (60 min): 20 ppm
   IDLH: 20 ppm
   Ambient Boiling Point: 20.8° C
   Vapor Pressure at Ambient Temperature: 0.68 atm
   Ambient Saturation Concentration: 685,288 ppm or 68.5%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
   Wind: 7.5 meters/second from nw at 7 meters
   Ground Roughness: open country         Cloud Cover: 10 tenths
   Air Temperature: 13° C                 Stability Class: D
   No Inversion Height                    Relative Humidity: 75%

SOURCE STRENGTH:
   Direct Source: 0.055 grams/sec         Source Height: 7 meters
   Release Duration: 60 minutes
   Release Rate: 3.3 grams/min
   Total Amount Released: 198 grams

THREAT ZONE: (GAUSSIAN SELECTED)
   Model Run: Gaussian
   Red    : LOC is not exceeded --- (20 ppm = AEGL-3 [60 min])
   Note: Threat zone was not drawn because
      the ground level concentrations never exceed the LOC.
   Orange: LOC is not exceeded --- (12 ppm = AEGL-2 [60 min])
   Note: Threat zone was not drawn because
      the ground level concentrations never exceed the LOC.
   Yellow: LOC is not exceeded --- (0.5 ppm = AEGL-1 [60 min])
   Note: Threat zone was not drawn because
      the ground level concentrations never exceed the LOC.
```

SO_2

File Edit SiteData SetUp Display Sharing Help

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 1 (user specified)
  Time: February 25, 2017  1405 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: SULFUR DIOXIDE
  CAS Number: 7446-9-5                    Molecular Weight: 64.06 g/mol
  AEGL-1 (60 min): 0.2 ppm   AEGL-2 (60 min): 0.75 ppm   AEGL-3 (60 min): 30 ppm
  IDLH: 100 ppm
  Ambient Boiling Point: -10.3° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 7.5 meters/second from nw at 7 meters
  Ground Roughness: open country          Cloud Cover: 10 tenths
  Air Temperature: 13° C                  Stability Class: D
  No Inversion Height                     Relative Humidity: 75%

SOURCE STRENGTH:
  Direct Source: 0.0023 grams/sec         Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 0.138 grams/min
  Total Amount Released: 8.28 grams
  Note: This chemical may flash boil and/or result in two phase flow.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (30 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (0.75 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: LOC is not exceeded --- (0.2 ppm = AEGL-1 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
```

CO

File Edit SiteData SetUp Display Sharing Help

Text Summary

```
SITE DATA:
  Location: ARAD, ARAD, ROMANIA
  Building Air Exchanges Per Hour: 1 (user specified)
  Time: February 25, 2017  1405 hours ST (user specified)

CHEMICAL DATA:
  Chemical Name: CARBON MONOXIDE
  CAS Number: 630-8-0                     Molecular Weight: 28.01 g/mol
  AEGL-1 (60 min): N/A   AEGL-2 (60 min): 83 ppm   AEGL-3 (60 min): 330 ppm
  IDLH: 1200 ppm     LEL: 125000 ppm      UEL: 742000 ppm
  Ambient Boiling Point: -191.7° C
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 7.5 meters/second from nw at 7 meters
  Ground Roughness: open country          Cloud Cover: 10 tenths
  Air Temperature: 13° C                  Stability Class: D
  No Inversion Height                     Relative Humidity: 75%

SOURCE STRENGTH:
  Direct Source: 0.77 grams/sec           Source Height: 7 meters
  Release Duration: 60 minutes
  Release Rate: 46.2 grams/min
  Total Amount Released: 2.77 kilograms
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red    : LOC is not exceeded --- (330 ppm = AEGL-3 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Orange: LOC is not exceeded --- (83 ppm = AEGL-2 [60 min])
  Note: Threat zone was not drawn because
     the ground level concentrations never exceed the LOC.
  Yellow: no recommended LOC value --- (N/A = AEGL-1 [60 min])
```

Conclusions to emissions and emissions

a) Regarding conducted emissions:

To assess exhaust emissions resulting from the combustion plant theoretical calculations were made for pollutant emissions and consumption by type of fuel used, the calorific value and emission factor.

Calculation was made for a calorific value of fuel used by 11,872 kWh / kg (42 MJ / kg - lower calorific value of fuel oil).

Source combustion burners is the combustion chambers and afterburner. Removal of combustion gases is passed through the basket dispersion (D = 0.4 m; H = 6.24 m).

Evaluation was made by comparing the limits permitted by Law 278/2013.

See results presented in Chapter 4.2.3. calculated values were below the permissible cf. VLE of Law 278/2013.

Since the burners in the incinerator equipment are the most advanced (with very low NOx amount) and the fuel used is filtered and desulfurized liquid (sulfur content <10 ppm), the emission of particulate, NOx and SO2 in the flue gas will be very low. Controlled burning will take place so that CO will be reduced.

Regarding nitrogen oxides (NOX):

To reduce NOX emissions are low NOX burners used. It will be appreciated that the permissible limits are not exceeded at the transmission (Cf. Law 278/2013, Appendix 5, the permissible limit value for

NOx liquid fuel fired furnaces of 450 mg / Nmc for the reference value of 3% O2.).

Regarding sulfur dioxide (SO2):

Sulfur oxide emissions are generated mainly by the presence of sulfur in the fuel .. The use of the desulfurized liquid fuel will lead to significant SO2 emissions. (See Law 278/2013, Appendix 5, the permissible limit value for the sulfur dioxide in liquid-fueled furnaces is 350 mg / Nmc for the reference value of 3% O2.);

Regarding powders: It will be appreciated that the purified gas combustion does not represent a significant source of particulate emissions. (See Law 278/2013, Appendix 5, the permissible limit value for the powder to liquid fuel powered furnaces is 30 mg / Nmc for the reference value of 3% O2);

Regarding carbon monoxide (CO):

Carbon monoxide always appears as an intermediate product of the combustion process, particularly in the substoichiometric combustion conditions. Reducing concentrations of CO resulting from the combustion process will be achieved by controlling and monitoring combustion.

After commissioning, it will monitor emissions from the chimney flue to check data evaluated and that the limits permitted by Law 278/2013.

b) Regarding unguided emissions*:*

Considering the stipulated measures, it is estimated that there will be no noticeable odors in sensitive areas.

Regarding unguided emissions generated by COV: Diesel tanks are equipped with level sensor, return pipe at installation for collecting emissions in case of leakage. The route of the fuel (diesel fuel) from the tank to the incineration system is sealed by pipelines. All these features are intended to reduce to 0 the unguided emissions generated by COVs.

Regarding the waste gas emissions: the CO, SO_2, NO_x and COVemissions generated through the combustion of diesel fuel used by the auto vehicles are totally insignificant because:

- the intensity of site traffic will be reduced
- only auto vehicles with low exhaust within legal ranges (EURO 5 and EURO 6) will be used

c) *At immission*

Predicting the levels of ambient air pollution generated by all sources related to the analyzed objective, at immission, was done through mathematical modeling of the fields of concentrations.

The evaluation was done by comparison with provisions of STAS 12574/1987 comprising "Air quality requirements in protected areas" and/or of Law 104/2011 regarding the quality of the surrounding air.

In order to determine the concentrations of pollutants at immission, a mathematical modeling software was used to calculate the field of concentrations. The coordinate system was chosen so as to cover the entire potentially affected area. With the help of the program, chart maps for the concentrations of pollutants at ground level were drafted, that include the analyzed objective, the potentially affected surrounding areas and the flavor concentration curves for the generated pollutants.

The methodology used to assess the impact of the pollutants discharged into the atmosphere

The degree of atmosphere contamination with pollutants generated by SC ALVI SERV LLC, in relation to the proposed situation, in the surrounding areas, was estimated using a mathematical model which is based on the Gaussian distribution of the concentration of pollutants into the atmosphere.

The climatological model used offers the possibility of simulating the route of the gases generated by grouped sources or the sources distributed on a larger area and of calculating the average levels for different periods of time. The model was developed using the complete theory of ISC3 American model (Sources Industrial Complex Models).

The mathematical model used to assess the impact of the pollutants discharged into the atmosphere is SIMPG V3 climatological model for calculating the field of concentrations and is based on Martin & Tikvart's theory.

The results of the estimates of concentration were presented in the form of isoconcentration maps for different mediation periods.

The emission data include the source's features: the geometrical height, diameter or emission area, the speed and the temperature of the pollutants, the mass flow rate of the pollutant.

Regarding the emissions, the chimney of the heat source of the incinerator was taken into consideration. Since that is the single heat source, a 1000 m x 1000 m grid was used.

The output data of the model are measured at each point of the grid covering the area of influence of the sources and the mean concentrations of each pollutant. Based on these data, the isoconcentrations and isofrequencies curves are drawn on the area map, highlighting the spatial distribution of the field of concentrations and the level of air pollution on a long-term and short-term exposure.

Using the mentioned climatological model, the concentrations for the pollution sources of the

analyzed objective were calculated. The program's input data were taken from the previous tables where the physical characteristic of the source, emission rate, flow and speed of the gases exhausted into the atmosphere are presented.

The maximum concentrations for short periods of time are based on the most unfavorable weather conditions in the analyzed area. Because for the calculated concentrations of air pollution, two or three of the above requirements must be met, which is a relatively rare situation, the maximum concentrations for short periods of time, the theoretical maximum level of pollution caused by the system's operation must be taken into consideration. This situation is unlikely to occur or may occur in the area rarely and for short periods. The coordinate system was chosen so that the whole affected area and all possible emission sources will be covered. With the help of the program, chart maps for the concentrations of pollutants at ground level were drafted, that include the analyzed objective, the potentially affected surrounding areas and the isoconcentration curves for the generated pollutants. The isoconcentration curves for the generated pollutants were plotted on a 1 km radius from the source of emission. The nearest residential area is located on SW direction at a distance of approx. 1.5 km from the analyzed site. For this reason, the dispersion simulation for the short mediation time was made on SW to NE wind direction, the situation considered the worst (when the wind is blowing towards the households) and from E-SE to V or V-NV (when the wind blows towards the border with Hungary).

The evaluation of the impact through dispersion modeling

In order to estimate the potential impact of the future objective on the surrounding area they were included in the possible range of the influence of the pollutants, especially residential areas located near the objective.

Dispersion maps were drafted for the following types of pollutant concentrations:

For emissions generated by ducted sources, dispersion maps were drafted, keeping into account the type of the pollutant, the land's conditions, the average air temperature, the dimensions of the area and the allowed limit of the pollutant in μg/mc.

Quality standards for air at immission

In Romania, the maximum allowed concentrations at immission are set by Law no. 104/2011 regarding the quality of the surrounding air. For the maximum allowed concentrations at immission for which no values are set by Law 104/2011, the values set in STAS 12574/1987- “The air from the protected areas” will be used. The maximum allowed concentrations are set so that the compliance will guarantee the safety of the unprotected population against the harmful effects of the pollutant substances.

The basis for establishing the acceptable values of the air pollutants' concentrations will be made based on the observations regarding the harmful effects of the emissions on the human being. Obviously there are limits for air purity, such as those that guarantee the protection of vegetation and ecosystems.

We can observe from these data that the values per se of the concentrations are not exhaustive; in other words, they would be incomplete if the mediation period of the concentration wasn't specified;

There are two types of exposures to the pollutants: short termed and long termed.

According to Law no. 104/2011 regarding the quality of the surrounding air, Annex 3, «Determining the requirements for the evaluation of the concentration of sulfur dioxide, nitrogen dioxide, nitrogen oxides, PM10 and PM2,5 particulate matter, lead, benzene, carbon monoxide, ozone, arsenic, cadmium, nickel and benzo (a) pyrene from the surrounding air, in a specific agglomeration area», the following limit values are regulated:

Sulfur dioxide(SO_2)

Table 1

	Human health		Ecosystems
	Hourly*	Daily	Annual
Limit values	350 µg/m^3	125 µg/m^3	20 µg/m^3
Superior limit	-	75 µg/m^3	12 µg/m^3
Inferior limit	-	50 µg/m^3	8 µg/m^3

Note: * - not to be exceeded more than 24 times per year
** - not to be exceeded more than 24 times per year

Nitrogen oxides (NOx)

Tabel 2

	Human health		Vegetation
	Hourly*	Annual	
Limit values	200 µg/m^3	40 µg/m^3	30 µg/m^3
Superior limit	140 µg/m^3	32 µg/m^3	24 µg/m^3
Inferior limit	100 µg/m^3	26 µg/m^3	19,5µg/m^3

Nota: * - a nu se depăși de mai mult de 18 ori pe an

Carbon monoxide (CO)

Tabel 3

	Daily value (average per 8 hours)
Limit values	10000 µg/m^3
Superior limit	7000 µg/m^3
Inferior limit	5000 µg/m^3

Conclusions regarding the impact of the objective's operation on the air environmental factor

From the analysis of the emissions generated by the type I8-1000 incinerator and the comparison

with the values of emissions generated by the main economic agent located in the vicinity of the analyzed site (CET Arad), we can conclude that:

- the values of NO_x, SO_2, CO and particulate matter's emissions generated by the analyzed incinerator are totally negligible when compared to those generated by CET Arad and fall within the VLA

Table 4

Poluttant	Quantity issued into the atmosphere			Maximum concentration issued		
	CET Arad emissions limits acc. AIM no. 10/2006 rev. 11.08.2011 to/year	Incinerator estimated quantity I8-1000 to/year	% CET incinerator /	Average measured value CET Arad acc. AIM no. 10/2006 rev. 11.08.2011 mg/Nm^3	Incinerator estimated quantity I8-1000 mg/Nm^3	% CET incinerator /
NO_x	933	0,608	0,00065	350*	60	0,17
SO_2	1852	0,026	0,00001	4900*	2,4	0,00049
CO	-	0,84		-	78,3	
Pulberi	176	0,013	0,00007	105*	1,2	0,011

* the oxygen concentration measured in the effluent gases: 14,2 %

- the values of greenhouse gas emissions from the analyzed incinerator are totally negligible when compared to those of CET Arad

Tabel 5

Valori emisii gaze cu efect de seră							
2014				2015			
CET 1 Arad t CO_2	CET 2 Arad t CO_2	estimat anual incinerator t CO_2	% incinerator / CET	CET 1 Arad t CO_2	CET 2 Arad t CO_2	estimat anual incinerator t CO_2	% incinerator / CET
11869	268833	194	0,016/0,0007	8144	139897	194	0,023/0,001
280702			0,0007	148041			0,001

- the propagation distances of the atmospheric pollutants' concentrations (for the highest registered wind speed = 7,5 m/s compared to the average annual speed = 2,4 m/s) are very small and fall under the limit of 1499,87 m (the distance to the nearest househ

Data	Determination period of time	Wind speed (km/h – m/s) Direction	Temperature ^{o}C	Nebulosity	Pollutant	Concentration ppm	Maximal distance of propagatio	Distance until the closest	Distance until the

		SE	NV	SSE	SV							
02.02.2017	13 - 15			21 / 5,8		9	50 % înnorat	NO_x	20	No overpassing	1499,87	
									12	137		
									0,5	1000		
								SO_2	30	No overpassing		
									0,75	No overpassing		
									0,2	No overpassing		
								CO	330	No overpassing		
									83	No overpassing		
									N/A	No overpassing		
06.02.2017	12 – 14	11 / 3				7	60 % ploaie	NO_x	20	111		14870
									12	155		
									0,5	862		
								SO_2	30	No overpassing		
									0,75	No overpassing		
									0,2	No overpassing		
								CO	330	No overpassing		
									83	No overpassing		
									N/A	No overpassing		
23.02.2017	13 – 14	17 / 4,7				10	cersenin	NO_x	20	No overpassing		
									12	No overpassing		
									0,5	No overpassing		
								SO_2	30	No overpassing		
									0,75	No overpassing		
									0,2	No overpassing		
								CO	330	No overpassing		
									83	No overpassing		
									N/A	No overpassing		
25.02.2017	14 – 15		27 / 7,5			13	100 % înnorat	NO_x	20	No overpassing		

										12	No overpassing	
										0,5	No overpassing	
									SO_2	30	No overpassing	
										0,75	No overpassing	
										0,2	No overpassing	
									CO	330	No overpassing	
										83	No overpassing	
										N/A	No overpassing	

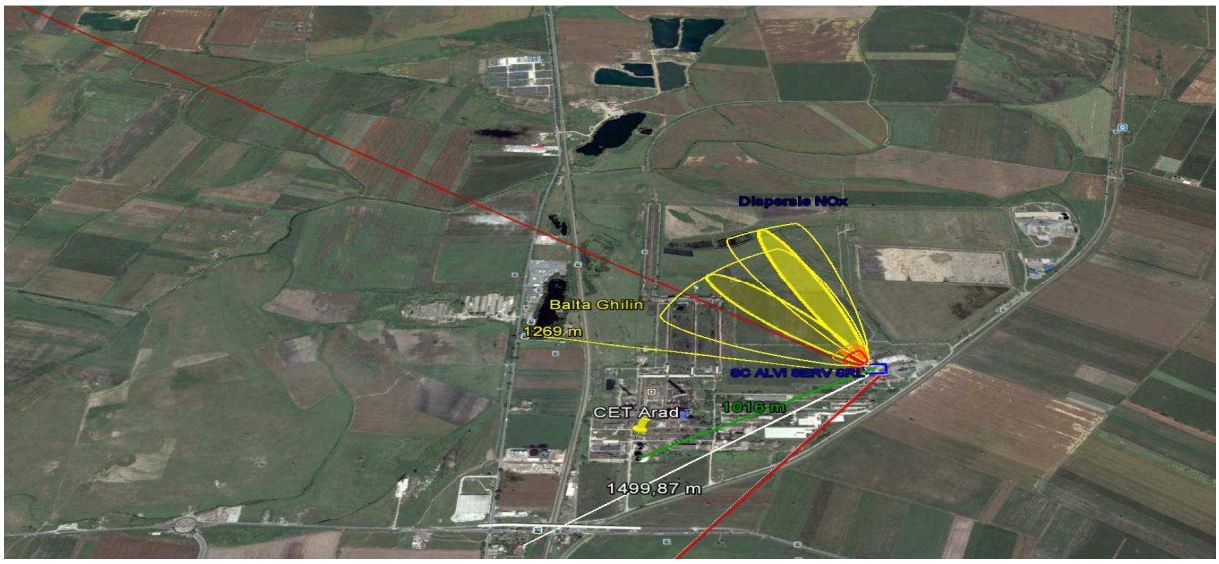


Figure 28

Given the above data, we can issue the following conclusions concerning the impact of the activity of I8-1000 type incinerator on the air environmental factor:

1. the direct impact is insignificantly negative and manifests on a very narrow area that doesn't go out of the limits of "the zone with polluting activity" which was established through a decision of the local council
2. there is no indirect or secondary impact
3. there is no significant impact on medium or long term given the reduced quantities of pollutants delivered in the atmosphere and given the air currents that contribute to their immediate dispersion
4. the cumulative impact with that of the existing facilities in the analyzed area is not significant (and even negligible) taking into account the fact that the emissions resulting from the activity of the incinerator are within percentages such as 0,602 % NO_x, 0,026 % SO_2, 0,013 particulate matter when compared to the emissions of CET1 and CET 2 Arad
5. the transboundary impact is not significant, almost neutral, on all levels (direct, indirect, secondary, cumulative, on short/medium/long term, temporary, permanent) because:

- the quantity values of the pollutants emitted in the air through the activity of type I8-1000 incinerator are small and fall within legal ranges
- the maximum propagation distance of the areas where the values of the pollutants' concentration are exceeded (there were registered exceedings only for NO_x) is (according to the mathematical modeling) 1000 m and the closest border crossing point is located at 14870 m from the incinerator's burnt gases chimney

Climate impact

It's not necessary.

Noise and vibration impact

The project to be implemented is not a significant source of noise or vibration.

The impact on the landscape and visual environment

Since the analyzed site is located in an exclusive area for polluting activities of Arad there is no question that there is a negative impact on the landscape and on the visual environment. It can be said that because of the very pleasant way, from the visual point of view, the visual impact of the space and how it is arranged in the area, there will be a significant positive view of all the objectives and lands that are located in the area.

The impact on historical and cultural heritage

Not applicable as there are no targets in close historical and cultural heritage site.

The impact on the interactions between these elements

There are not identified at this time, information leading to the conclusion that there could be an impact of the proposed project on all the factors listed above. All actions / activities that will take place both in the

construction phase and the operational phase, will not have significant adverse effects on the interaction of the elements discussed above.

The extension of the impact (geographic area, the size of affected population / habitats / species):

At this moment, there is no identifiable information that could lead to the conclusion that the impact of the project could extend to any of the abovementioned factors.

All the actions/activities that will take place, both in the construction stage and the exploitation stage, won't have any significant negative effect on the environmental factors.

The magnitude and the complexity of the impact:

All the actions/activities that will take place, both in the construction stage and the exploitation stage, won't have any significant negative effect on the environmental factors.

The probability of the impact:

All the actions/activities that will take place, both in the construction stage and the exploitation stage, won't have any significant negative effect on the environmental factors.

The duration, frequency and reversibility of the impact:

All the actions/activities that will take place, both in the construction stage and the exploitation stage, won't have any significant negative effect on the environmental factors. All the matters concerning this problem will be analyzed in chapter IV.

The measures for avoiding, reducing or improving the significant impact on the environment:

Compliance with the provisions of the legislation (the approvals and agreements issued by the competent authorities in the field of environmental protection and water management).

The transboundary nature of the impact:

There is no anticipated transboundary impact as a result of the activity of the project that will be

implemented.

Air environmentalagent

The transboundary impact is not significant, almost neutral, on all levels (direct, indirect, secondary, cumulative, on short/medium/long term, temporary, permanent) because:

- the quantity values of the emitted atmospheric pollutants through the activity of type I8-1000 incinerator are small and fall within legal ranges
- the maximum propagation distance of the areas where the values of the pollutants' concentrations are exceeded (there were registered exceedings only for NO_x) is (according to the mathematical modeling):
  - ❑ 1000 m for values of 0,5 ppm of the pollutants' concentrations
  - ❑ 155 m for values of 12 ppm of the pollutants' concentrations
  - ❑ 111 m for values of 30 ppm of the pollutants' concentrations

  and the nearest border crossing point is located at 14870 m from the incinerator's burnt gases chimney
- the main direction of the wind is not towards the border with Hungary

Table 6

Direction	N	NE	E	SE	S	SV	V	NV	Calm
Frequency(%)	12,8	5,4	4,4	16,1	12,0	8,1	6,1	8,1	27,0

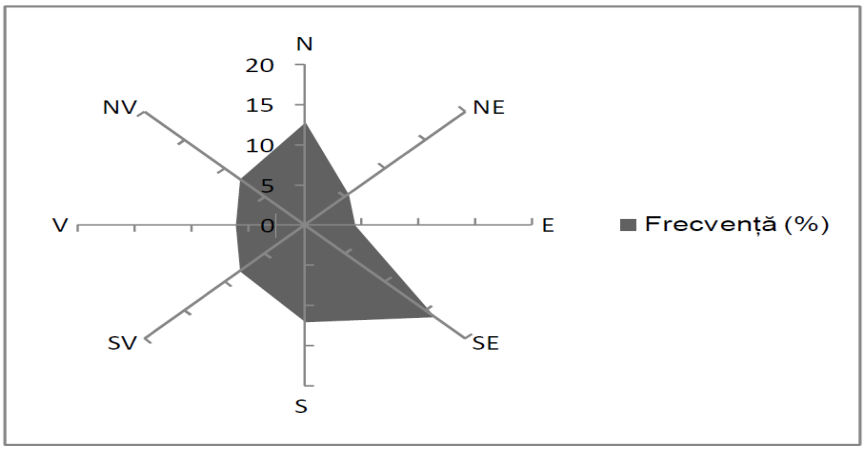


Figure 7

Water environmental factor

The wastewaters generated on the analyzed site go, via vidanja transport, to Arad's wastewater

treatment plant where they receive an advanced treatment process according to the provisions of HG 188/2002 amended by HG 325/2005, Annex 3, table 1 (NTPA 001/2005). After treatment the waters are evacuated into the Mures river.

The concentration of the wastewater pollutants resulting on the analyzed site fall within the maximum limits according to HG 325/2005, Annex 2, tab1e (TPA 02/2005), a reason for which these waters won't disturb the treatment process from Arad's treatment plant.

At Arad's treatment plant, the wastewaters across the entire municipality are being treated. The main source of the plant is made up of the wastewaters collected from the local households, tenants' associations, public institutions, local service providers, diverse economic agents etc.

The debit of the wastewaters resulted on the analyzed site is 2,06 m^3/day = 0,0858 m^3/hour = 0,000023 m^3/s.

The quality of the receptor (Mureș river), whose average annual debit is 184 m^3/s, won't be affected by the wastewaters resulted from the treatment process of the waters from the analyzed site because their debit is insignificant (0,000023 m^3/s for the wastewaters compared to 184 m^3/s for Mureş river) and the pollutants' concentrations when dispersed fall within the legal ranges (NTPA 001/2005), being efficiently treated at Arad's treatment plant.

Mureș river goes a 67 km distance from Arad's treatment plant until the Romanian-Hungarian border crossing point, of which 21 km is on border and another 50 km is within Hungary (until Szeged) where it joins Tisza river.

Given the following facts:

- the average annual debit of Mureș river is 184 m^3/s
- the debit of the wastewaters resulted on the analyzed site and treated at Arad's treatment plant, right before evacuated in the natural receptor (Mureș river), is 0,000023 m^3/s and thus almost insignificant when compared to the average annual debit of Mureș river
- the debit of the wastewaters resulted on the analyzed site and treated at Arad's treatment plant, right before evacuation in the natural receptor (Mureș river), is almost insignificant when compared to the debit of the wastewaters that go into the treatment plant
- the dilution effect of the waters evacuated into Mureș river is instantly analyzed by the ration between the debit of the wastewaters resulted on the analyzed site (0,000023 m^3/s) and the average annual debit of Mureș river (184m^3/s)
- the distance made by Mureș river from the evacuation point of Arad's treatment plant until the Romanian-Hungarian border crossing point it 67 km

a transboundary impact is out of question.

Soil environmental agent

A transboundary impact is not anticipated as a result from the project activity to be implemented.

IV. THE SOURCES OF POLLUTANTS AND THE INSTALLATIONS FOR RETENTION, EVACUATION AND DISPERSION OF THE POLLUTANTS WITHIN THE ENVIRONMENT

IV.1. Protection of the water quality:

Sources of wastewaters and their compounds

Following the development of the activities of the construction of the cover systems as well as the activities of the placement of the incinerator, there will result only domestic wastewaters from the bathrooms. These will be collected in the concrete basin with a capacity of 30 mc per placement.

From the activity of the exploitation of the incinerator there will be industrial wastewaters generated in the stage of the cleaning of the containers destined for the transportation of the no dangerous animal waste. These waters are collected through a sewer system that already exists on location, in the emptying basin with a volume of 80 mc. This basin is currently used for the same purpose, collecting the wastewaters resulted from the activity of the incinerator that already exists on location.

The causes that can lead to a potential pollution of the surface waters, like groundwater, through the infiltration of the pollutants in the groundwater, during the implementation stage of the project, as well as during the functioning stage, can be linked to:

- accidents during the normal functioning of the equipment used during the construction stage (crane, forklift) that can generate possible accidental losses of lubricants and/or fuel
- possible accidental deterioration of the gas oil tanks from the vehicles serving the activity
- possible accidental losses of lubricants from the equipment or vehicles serving the activity

Even in the unlikely event of these situations, we will take into account that:

- all the activities on the placement will unfold only on concrete platforms
- there are no surface waters nearby. The nearest surface water is Chilin Pond, at a distance of 1248 m

It is practically impossible that a surface water pollution will occur as a result of the activity of the company.

There remains a very small probability that an accidental groundwater pollution can be generated if no prevention measures will be taken.

To avoid an accidental pollution of the surface waters and groundwater, it is recommended:

- to ensure in due time the verification of the functionality of the engines and other installations
- to permanently ensure the verification of the fuel tanks of the vehicles serving the activity
- to forbid any setting of fuel or oil storages in places other than those already existing and that comply with the environmental protection rules;
- all works concerning the maintenance and repairing of the equipment and transportation vehicles will be done only in specially designated places, outside the construction area;
- to forbid the cleaning of the equipment within the placement, except desinfectation cleaning
- the supply of diesel fuel and lubricants will be done while assuring all the conditions for avoiding accidental losses and environmental protection;
- any noted pollution of the surface waters or the phreatic aquifer, regardless of the pollution cause, will be reported immediately to the Mures Administration – The Water Management System Arad and the Environmental Guard Arad.

The pollutants evacuated in the environment or the public sewer system or other sewers (in mg/l and kg/day)

The work carried out by Alvi Serv SRL on the analyzed site leads to domestic wastewaters and industrial wastewaters. These wastewaters will not be evacuated into the public sewage system, and instead will be collected into the two drainage tanks located on the analyzed site. From there they are collected through discharging by authorized companies and are taken to Arad's treatment plant.

For an accurate estimation of the pollutant quantities resulted from the activities taking place on the site after the implementation of all planned projects (I8-1000 and I8-40A incinerators), the wastewater quantities resulted from the activity taking place on the site must first be estimated.

Calculation breviary

The quantities of supply water were determined according to: STAS : 1342 / 2-87, 1343 / 1-90, 1478 / 90, Ord. M.S. nr.1957 / 95.

The flows of sewage water were determined according to STAS 1846 / 90.

The quantities of rain water were determined according to STAS 1846 / 90.

Determining the quantities of waters necessary for the activities:

A. Necessary water for employers' health and hygiene consumption Nig
B. Necessary technological water for the washing of animal waste containers Nt

X. Operation mode 320 days/year, 12 hours/day.

A. Necessary water for employers' health and hygiene consumption - Npi

- administrative personnel = 2 persons x 60 l/day;
- logistics personnel = 8 persons x 60 l/day.

Npi = 10 x 60 l/day = 600 l/day = 0,6 mc/day.

Npi = 0,6 mc/day.

B. Necessary water for washing and sanitizing the containers and the interior of the special vehicles, Nt made of:

Water for sanitizing the containers that were used at non-dangerous animal waste transportation - approx. 50 pieces/day;

Alvi Serv = 50 containers ($V_{container}$ = 1 mc) x 60 l/piece = 3000 l/day = 3 mc/day;

Water for sanitizing the interior of the special vehicles that were used for non-dangerous animal waste transportation - approx. 3 pieces/day;

Alvi Serv = 3 special vehicles x 400 l/piece = 1200 l/day = 1,2 mc/day

Nt = 3 + 1,2 = 4,2 mc/day.

Average necessary water for use N:

N = Npi+ Nt = 4,2 + 0,6 = 4,8 mc/day

Total necessary water for Alvi Serv:

- $Q_{day\ maximum} = Q_{day\ average}$ x 1,2 = 5,76 mc/day = 0,066 l/s = 1843,2 mc/year;
- $Q_{day\ average}$ = 4,8 mc/day = 1,19 l/s = 1536 mc/year.
- $Q_{day\ minimum} = Q_{day\ average}$ x 0,8 = 3,84 mc/day = 0,44 l/s = 1228,8 mc/year.

Total water requirement for Alvi Serv Q_s :

$Q_{s\ mediu} = K_s \times K_p \times N / 1.000 = 1,02 \times 1,1 \times 4,8 =$ 5,38 mc/day.

- $Q_{day\ maximum}$ = 6,456 mc/day = 0,75 l/s = 2065,92 mc/year;
- $Q_{day\ average}$ = 5,38 mc/day = 0,62 l/s = 1721,6 mc/year.
- $Q_{day\ minimum}$ = 4,3 mc/day = 0,5 l/s = 1378,28 mc/year.

Necessary water for domestic purpose:

Average necessary water for domestic purpose = 0,6 mc/day;

- Q day maximum = 0,72 mc/day = 0,008 l/s = 230,4 mc/year;
- Q day average = 0,6 mc/day = 0,07 l/s = 192 mc/year.
- Q day minimum = 0,48 mc/day = 0,055 l/s = 153,6 mc/year.

Drinking water requirement: Ks x Kp x Ni =1,02 x 1,1 x 0,6 = 0,673 mc/day;

Q day maximum = 0,808 mc/day = 0,09 l/s = 258,43 mc/year.

Q day average = 0,673 mc/day = 0,078 l/s = 215,36 mc/year.

Q day minimum = 0,538 mc/day = 0,062 l/s = 172,29 mc/year.

Necessary water for technological purpose:

Average necessary water for technological purpose: 95,54 mc/day;

- Q day maximum = 5,76 mc/day = 0,067 l/s = 1843,2 mc/year;
- Q day average = 4,8 mc/day = 0,056 l/s = 1536 mc/year.
- Q day minimum = 3,84 mc/day = 0,044 l/s = 1228,8 mc/year.

Technological water requirement:

Average water requirement : Ks x Kp x Nt =1,02 x 1,1 x 4,8 = 5,39 mc/day.

- Q day maximum = 6,468 mc/day = 1,43 l/s = 2069,76 mc/year.
- Q day average = 5,39 mc/day = 1,33 l/s = 1724,8 mc/year.
- Q day minimum = 4,312 mc/day = 1,07 l/s = 1379,84 mc/year.

The volumes of water used during the authorized activity on the site are:

- $V_{max.}$ = 129,6 m^3/month
- $V_{min.}$ = 86,4 m^3/month
- $V_{ave.}$ = 108 m^3/month

The total volumes of the wastewater (both domestic and technological) that will result from Alvi Serv SRL's

activity are:

Qwa day maximum = 5,4 mc/day = 1728 mc/year.

Qwa day average = 4,32 mc/day = 1382,4 mc/year.

Qwa day minimum = 3,46 mc/day = 1107,2 mc/year.

The breakdown of the volumes of domestic and technological wastewaters

The volumes of domestic wasterwater are:

Qwa day maximum = 0,6 mc/day x 0,80 = 0,48 mc/day = 153,6 mc/year.

Qwa day average = 0,48 mc/day x 0,80 = 0,38 mc/day = 98,3 mc/year.

Qwa day minimum = 0,38 mc/day x 0,80 = 0,2 mc/day = 64 mc/year.

The volumes of technological wasterwater are:

Qwa day maximum = 4,8 mc/day x 0,80 = 3,84 mc/day = 1228,8 mc/year.

Qwa day average = 3,84 mc/day x 0,80 = 3,07 mc/day = 983,04 mc/year.

Qwa day minimum = 3,07 mc/day x 0,80 = 2,46 mc/day = 785,02 mc/year.

Domestic wastewaters

The pollutants evacuated in the environment or the public sewer system or other sewers (in mg/l and kg/day)

The waters will be evacuated in the emptying basin with V = 30 mc that can be found on the analyzed placement.

The personnel that participates at the construction works is comprised, on average, of 10 persons.

The pollutants that are evacuated daily in domestic wastewaters, as well as their quantities are experimentally presented in the following table.

Table 7The average composition of wastewaters

Parameter	Load (g/habitant/day)	Concentration (mg/liter)	Total load for 10 persons (mg/liter) minimum and maximum limit		Total load for 10 persons (kg/day) minimum and maximum limit	
Total solids	115-170	680-1000	6800	10000	1,150	1,700
Volatile solids	65-85	380-500	3800	5000	0,650	0,850
Suspension solids	35-50	200-290	2000	2900	0,350	0,500
Suspension volatile solids	25-40	150-240	1500	2400	0,250	0,400
CBO5	35-50	200-290	2000	2900	0,350	0,500
CCOCr	115-125	680-730	6800	7300	1,150	1,250
Total nitrogen	6 – 17	35-100	350	1000	0,060	0,170
Ammonium	1 – 3	6 - 18	60	180	0,010	0,030
Nitrites, nitrates	<1	<1	<1	<1	<1	<1
Total phosphorus	3 - 5	18-29	180	290	0,030	0,050
Phosphates	1 - 4	6 - 24	60	240	0,010	0,040
Total coliforms	-	1010-1012	-	-	-	-
Faecal coliforms	-	108-1010	-	-	-	-

For the exploitation stage, 3 more people will be employed beside the 5 people that are currently employed. The loading intake for the 3 newly employed persons, concerning domestic wastewaters, is presented in the following table:

Table 8

Parameter	Load (g/habitant/day)	Concentration (mg/liter)	Total load for 10 persons (mg/liter) minimum and maximum limit		Total load for 10 persons (kg/day) minimum and maximum limit	
Total solids	115-170	680-1000	6800	10000	0,345	0,510
Volatile solids	65-85	380-500	3800	5000	0,195	0,255
Suspension solids	35-50	200-290	2000	2900	0,105	0,150

Suspension volatile solids	25-40	150-240	1500	2400	0,075	0,012
CBO5	35-50	200-290	2000	2900	0,105	0,150
CCOCr	115-125	680-730	6800	7300	0,345	0,375
Total nitrogen	6 – 17	35-100	350	1000	0,018	0,051
Ammonium	1 – 3	6 - 18	60	180	0,003	0,009
Nitrites, nitrates	<1	<1	<1	<1	<1	<1
Total phosphorus	3 - 5	18-29	180	290	0,009	0,015
Phosphates	1 - 4	6 - 24	60	240	0,003	0,012
Total coliforms	-	1010-1012	-	-	-	-
Faecal coliforms	-	108-1010	-	-	-	-

The estimation of the values of the loads from the domestic wastewaters resulted from the activity of S.C. AlviServ S.R.L. on the analyzed location was done through the corroboration of the average number of inhabitants reported to the number of hours from „The average composition of domestic wastewaters (Imhoff – 1990) in g/habitant/day". There wasn't made any analysis bulletin for these loads.

By analyzing the water load based on the results of previous tests (test report 23T) in conjunction with domestic wastewater volumes expected to be generated on the analyzed site, we obtained the results shown in the table below:

Table 9

Parameter	**Valuers annalysis bulletin**	**U.M.**	**Maximum estimated volumefor domestic wastewaters m^3**			**Maximum charge volume kg**			**VLA acc. NTPA 002/2005**
			daily	monthly	annual	daily	monthly	annual	
pH	6,72	unit. pH							6,5 – 8,5
Total materials in suspension	32	mg/l	0,6	15	180	0,019	0,48	5,7	350
CCOCr	320	mgO_2/l				0,19	4,8	57	500
CBO_5	42	mgO_2/l				0,025	0,63	7,56	300
Amonia	3,22	mg/l				0,0019	0,048	0,58	30
Total phosphore	2,3	mg/l				0,0014	0,035	0,414	5

Industrial wastewaters

These waters are evacuated into drainage tanks with V = 30 mc which are located on the analyzed site.

By analyzing the water load based on the results of previous tests (test report 511T) in conjunction with industrial wastewater volumes expected to be generated on the analyzed site, we obtained the results shown in the table below:

Table 10

Parameter	Valuers annalysis bulletin	U.M.	Maximum estimated volumefor domestic wastewaters m^3			Maximum charge volume kg			VLA acc. NTPA 002/2005
			daily	monthly	annual	daily	monthly	annual	
pH	6,70	unit. pH							6,5 – 8,5
Total materials in suspension	30	mg/l	4,8	102,4	1228,8	0,144	3,072	36,86	350
CCOCr	120	mgO_2/l				0,576	12,288	147,456	500
CBO_5	42	mgO_2/l				0,202	4,3	54,13	300
Amonia	8,74	mg/l				0,042	0,895	11,26	30
Total phosphore	0,89	mg/l				0,0043	0,091	1,147	5

The values of the indicators in the domestic wastewaters will fall within the limits stipulated in H.G. 352/2005, NTPA 002.

IV.2. Air protection:

Air sources and pollutants

The sources of air pollution are:

- stationary sources – the incinerator's chimney that will be mounted on the placement
- mobile sources. The mobile sources of air pollution are the equipment and vehicles used during construction stage and then the exploitation stage. The equipment has diesel or gasoline engines (the vehicles of the technical personnel), so that the main gas pollutants evacuated in the atmosphere (through ejection) are: carbon monoxide, nitric oxides, nitrogen oxides, Sulphur oxides, persistent organic pollutants, dusts.

Table 11: The concentration of the main pollutant substances from the evacuation gases for different types of engines and functioning modes

Pollutant	Concentration	Idle		Acceleration		Decelation	
		MAS	MAC	MAS	MAC	MAS	MAC
carbon monoxide	%	7,0	traces	1,8	traces	2,0	**traces**

Hydrocarbs	%	0,5	0,04	0,1	0,01	1,0	**0,03**
nitric oxide	**ppm**	30,0	60,00	*650,0*	250,00	20,0	**30,00**
aldehydes	**ppm**	**10,0**	**20,00**	**10,0**	**10,00**	**200,0**	**30,00**

MAS – spark ignition engine;

MAC – compression ignition engine.

- Dust emissions resulted from
  - the movement of vehicles involved in the construction process and the placement of the incinerator
  - the operation of the machinery and materials during the construction stage, in the investment placement area

The pollutants evacuated in the atmosphere (in mg/mc and g/s):

A. The construction stage and the placement of the incinerator

During the construction process of the analyzed objective, pollutants from 2 distinct types of sources are evacuated:

1. Emissions generated by the functioning of the thermal engines from the equipment and vehicles serving the activity

The motor vehicles and equipment used during the construction stage, as well as those used during the transportation of the personnel have diesel or gasoline engines, such that the main gas pollutants evacuated in the atmosphere (through ejection) are:

- carbon monoxide
- nitrogen oxides
- Sulphur oxides
- persistent organic pollutants
- dusts

2. Dust emissions generated by:

- the movement of the equipment and vehicles on the roads
- the construction activities (the transportation of the metallic construction elements, the loading/unloading of the materials etc.)

A. The exploitation stage of the incinerator

In this stage, there will be 3 distinct sources of emissions:

1. emissions generated by the incineration activity – this activity generates burnt gases made of the following pollutant substances:
   - total powders
   - organic substances in gaseous or vapor state, expressed in total organic carbon (COT)
   - hydrochloric acid
   - hydrofluoric acid
   - sulf dioxide [SO(2)]
   - nitric oxide (NO) and nitrogen dioxide [NO (2)] expressed as NO (2)
   - dioxins and furans
2. emissions generated by the functioning of the thermal engines from the equipment and vehicles serving the activity
3. dust emissions generated by:

- the movement of the equipment and vehicles on the roads
- the construction activities (the transportation of the metallic construction elements, the loading/unloading of the materials etc.)

Installations for retention and dispersion of the pollutants in the atmosphere:

To retain and disperse in the atmosphere the pollutants generated in the incinerator following the incineration process of the waste, this is equipped with one of the most modern and performant systems made of:

- the burning installation of the gases generated in the main burning chamber – the secondary burning chamber
- the inertial installation for the retention of the gases burnt for 2 seconds in the secondary burning chamber at a minim temperature of 850 ^{o}C - 1100 C
- the installation for the washing of the Venturii type gases made of 2 steps:
  - washing chamber
  - hydro cyclone
- chimney

All this equipment and the functioning mode have been described in chapter III.

All the emissions generated by the incineration activity falls within the values stipulated in Law no. 278/2013, Incineration chapter, namely:

Table 12: Daily average limit values

No.	Pollutant substance	Limit values (mg/Nm^3)
1.	Total powders	10
2.	Organic substances in gaseous or vapor state, expressed in total organic carbon (COT)	10
3.	Hydrochloric acid	10
4.	Hydrofluoric acid	1
5.	Sulf dioxide [SO(2)]	50
6.	Nitric oxide (NO) and nitrogen dioxide [NO (2)] expressed as NO (2)	200

Table 13: Average emission limit values for half an hour

No.	Pollutant substance	Limit values (mg/Nm^3)	
		(100 %) A	(97 %) B
7.	Total powders	30	10
8.	Organic substances in gaseous or vapor state, expressed in total organic carbon (COT)	20	10
9.	Hydrochloric acid	60	10
10	Hydrofluoric acid	4	2
11	Sulf dioxide [SO(2)]	200	50
12	Nitric oxide (NO) and nitrogen dioxide [NO (2)] expressed as NO (2)	400	200

The average emission limit values (mg/Nm^3) for dioxins and furans for a period of minimum 6 hours and maximum 8 hours = 0,1

Table 14: Limit values for carbon monoxide emissions

Measured element	Measurement interval	Allowed limit value (mg/Nm^3)	Exceptions
Carbon monoxide	Average daily value	50	Startup and shutdown period
	Average value for half an hour, during 24 hours	100	
	The concentration in combustion gas at minimum 95% for all measurements (determined as average values for 10 minutes)	150	

IV.3. Protection against noise and vibration:

Noise and vibration sources:

The protection against noise is regulated by «Normative concerning protection against noise», indicative 1, approved by the Ministry of Transportation, Constructions and Tourism in 2003. In the particular case of this project, the protection against noise is determined according to the map of the noise curb, compiled according to the technical specifications of the equipment, by the German specialized company DEUTSCHE WINGUARD. In the abovementioned normative, the following are mentioned:

The accepted limits of the noise levels equivalent exterior buildings Lech, at a distance of 2,00 m from the facade and height of 1,30 m from the ground or the level considered for the protected buildings, are indicated in the following table:

Table 15 Approved limits of the noise level generated in the proximity of protected buildings

No.	Protected building	The accept limit of the noise level equivalent dB (A)	The order number of the corresponding Cz curb
1.	Houses, hotels, hostels, guest houses	55	50

2.	Hospitals, polyclinics, dispensaries	45	40
3.	Schools	55	50
4.	Kinder gardens, nurseries	50	45
5.	Office buildings	65	60

The noise sources are:

- equipment involved in construction works
- motor vehicles involved in construction works
- motor vehicles involved in transportation of the waste destined for incineration
- the incinerator during operation mode

Equipment, installation and protection measurements against noise and vibrations

It is not the case.

Noise and vibration level

There weren't made any measurements of the noise and vibration levels; we can estimate that the noise level will not exceed the property's limit, the maximum limit approved by the Health Minister's Order no. 119/2014 for approval of the Hygiene and Public Health's legislation regarding the living environment of the population.

IV.4. Protection against radiations:

It is not the case.

IV.5. Protection of the soil and subsoil

The whole activity will take place on concrete platforms on the analyzed placement, a fact which constitutes a good protection against soil pollution.

Possible sources of soil and subsoil pollution

Possible sources of soil pollution are:

- accidental leakages of fuel or lubricants from the vehicles and equipment serving the construction activity and then the exploitation activity of the incinerator

- accidental leakages of fuel and lubricants from the vehicles and equipment serving the exploitation activity of the incinerator

Measurements, equipment and installations for the protection of the soil and subsoil

To avoid soil pollution, the following measurements have been provided:

- to assure, in due time, the verification of the functionality of the thermal engines of the vehicles serving the construction activity
- there are no fuel or oil tanks except in the areas equipped with all the necessary elements according to the legislation;
- maintenance and repairing works at the equipment and vehicles will be done only in specially designated places;
- there will be no washing of the equipment or vehicles within the placement, except for the hygienization of the means of transportation of non-dangerous animal waste;
- the supply with diesel or lubricants for the equipment will be done ensuring all the conditions for avoiding accidental losses and environmental protection in specially designated places – fuel stations;
- all the equipment and vehicles used in the construction activity and then in the incineration activity run on special roads and are parked on concrete platforms
- the waste for incineration will be deposited temporarily only in specially designated containers, placed in specially designated places
- the waste resulted from the incineration process will be collected in special recipients placed in the corresponding designated area.

IV.6. Protection of the terrestrial and aquatic ecosystems

Normally, all the activities that will take place both in the construction and the exploitation stage of the incinerator will not have any negative effects on the terrestrial and aquatic ecosystems.

IV.7. Protection of the human settlements and other objectives of public interest

The identification of the objectives of public interests, distance to the human settlements, historical and architectural monuments, other restricted areas, traditional interest areas etc.:

The studied placement is located on the north extremity of Arad – the North industrial area, where there are no historical or architectural monuments or other restricted areas, traditional interest areas etc.

The nearest house is located at about 1424 m from the location where the incinerator will be placed.

Works, equipment and measurements for protection of human settlements and the objectives that are protected and/or are of public interest :

All the actions/activities that will take place both in the construction stage and the exploitation stage of the incinerator will not have any negative effects on human settlements and there is no need of further measurements for the protection of human settlements or the objectives of public interest.

IV.8. The management of the waste generated on the placement

A. Waste generated in the construction stage

The management of the waste generated in the construction stage will be the subject of the site management, according to the legislation in force. The expected waste will be:

- domestic or assimilable;
- ferrous metallic – resulted from the execution of metallic structures
- nonferrous metallic – resulted from the electrical connections

Table 16: Estimated quantities of waste generated in the construction stage

Waste type	Waste code*	Source of generation	Storage mode	Proposed mode of elimination / valorification of the waste	Estimated quantities
Metallic waste	17 04 05	The placement of metallic structures for the constructions	Ballasted platform	Is valorified by authorized economic agents	0,05 t
Electrical wires waste	17 04 11	The construction of electrical wires and connections	Ballasted platform	Is valorified by authorized economic agents	0,01 t
Domestic waste	20 03 01	The activity of the personnel	Eurobins placed on the platform	Is eliminated by the economic agents authorized by the Local Council of Arad	1 mc

B. Waste generated in the exploitation stage

The waste generated in this stage is listed in the following table:

Table 17

Waste type	Waste code*	Frame according to HG 856/2002	Source of generation	Storage mode	Proposed mode of elimination / valorification of the waste	Daily estimated quantities

Sludge	19 01 07*	Solid waste from gas treatment	Installation for washing of the gases from the incinerator	In the vat of the washing installation	Is eliminated through incineration in the incinerator that will be installed	2 kg
Ash	19 01 12	Burning ashesand slagsothers than the ones mentioned at 19 01 11*	incinerator	Containers with a capacity of 1100 l	Is eliminated by the economic agents authorized by the non-dangerous deposit from Arad	150 kg
Domestic waste	20 03 01		The activity of the personnel	Eurobins placed on the platform	Is eliminated by the economic agents authorized by the Local Council of Arad	1 mc/month

IV.9. The management of dangerous substances and chemical products

Dangerous substances and chemical products used and/or produced

No dangerous chemical substances will be produced on the placement.

The only dangerous chemical substances used on the placement will be the dangerous waste collected from different generators that will be temporarily stored and then incinerated.

The management mode of the dangerous substances and chemical products and the measurements for the protection of the environment and public health:

The dangerous chemical waste collected from the generators for elimination through incineration will be temporarily stored in a specially designated area for this purpose. This storage will be used only in case the collected waste will not go directly to the incineration process.

The storage area for dangerous waste in solid, pasty of liquid state is located at 18 m from the place where the new incinerator will be installed, on concrete platform, covered and aired, having the following dimensions:

- S = 870,3 m^2
- L = 13,77 m
- l = 5,83 m

This solution has been adopted in order to avoid the risk of potential fires in case of accidents caused by possible errors or exploitation.

The platform is located on the north-east side of the placement (according to the attached site plan), at the entrance of the placement, on the left side. This area was chosen in order that the platform will be isolated as much as possible from the rest of the placement, with a concrete access way, in an area that allows the

secure handling of the containers.

This area will be surrounded by wire mesh and will be dived in 3 compartments, one for dangerous solid waste, one for dangerous pasty waste and one for dangerous liquid waste.

The dangerous solid waste will be transported and stored (only if it is the case, that is if they can't enter the incineration flux), until incineration (several hours), in special metallic containers with V = 1 m^3 in cell 1 of the storage space. These containers will be equipped with caps.

The dangerous pasty waste will be transported and stored (only if it is the case, that is if they can't enter the incineration flux), until incineration (several hours), in special containers made of corrosion and solvent resistant materials (being specially made for such substances) with V = 1 m^3 in cell 2 of the storage space. These containers will be equipped with sealing caps in order to avoid dangerous emissions.

The dangerous liquid waste will be transported in special containers with V = 1 m^3 in equipped with caps and will be temporarily stored in cell 3.

The handling of the containers for dangerous waste (solid, pasty of liquid) will be done only automatically, that is:

- loading and unloading from the transportation vehicles will be done with a forklift and/or crane (only if it is the case)
- the transportation of the containers from the temporary storage area to the incinerator will be done with a forklift
- the emptying of the containers in the burning chamber of the incinerator will be done with a forklift and an automatic supply system.

The maximum capacity of the dangerous waste deposit will be 8 t, being equally divided for the 3 compartments. The compartments will be organized in 2 lateral storage area with an access way on the middle so that the forklift will be easily handled.

The compartment destined for dangerous pasty waste as well as that for dangerous liquid waste will be organized on areas such that there won't be any containers nearby that contain waste that can chemically interact with each other. Moreover, the containers with highly corrosive waste will be deposited on the same side, in the specially designated area.

V. PROVISIONS FOR MONITORING THE ENVIRONMENT

Equipment and measurement provided for the control of the pollutant emissions

1. a continuous monitoring system of the incinerator burnt gases' parameters will be installed

2. a video monitoring system will be installed for:
    - the dangerous waste storage
    - the placement area of the incinerator
3. all vehicles that will transport dangerous waste from the generator to the incinerator will be monitorized

VI. JUSTIFICATION OF THE PROJECT, AS IS THE CASE, IN THE PROVISIONS OF OTHER NATIONAL LAWS THAT TRANSPOSE THE EUROPEAN LEGISLATION (IPPC, SEVESO, COV, LCP, FRAME DIRECTIVE FOR WATER, FRAME DIRECTIVE FOR AIR, FRAME DIRECTIVE FOR WASTE ETC.)

It is not the case.

VII. NECESSARY WORKS FOR SITE MANAGEMENT:

The description of the necessary works for site management:

No special works are necessary for site management because this will be placed inside the placement belonging to S.C. Alvi SERV S.R.L. (a company that is already authorized for incineration activities) and will use its equipment.

The description of the environmental impact of the site management:

It is not the case.

The sources of pollutants and installations for retention, evacuation and dispersion of the pollutants in the environment during site management:

The possible sources of pollutants are caused by accidental losses of fuel and/or lubricants from the equipment and vehicles serving the placement of light constructions and the placement of the incinerator, as well as the waste generated by this activity.

In order to counteract the effect of the environmental factors of soil and water in case of accidental losses of fuel and/or lubricants from the equipment and vehicles serving the activity will assure a stock of biodegradable materials on the placement (Nature Sorb, Spill Sorb, etc.)

Equipment and measurements provided for the control of the pollutant emissions: it is not the case.

VIII. RESTORATION WORKS OF THE PLACEMENT AT THE COMPLETION OF THE INVESMENT, IN CASE OF ACCIDENTS AND/OR END OF ACTIVITY, WHERE THIS INFORMATION IS AVAILABLE:

The proposed works for restoration of the placement at the completion of the investment, in case of accidents and/or the end of activity:

The ecological restoration works include the removal of the waste specific to the incinerator from the terrains where light constructions where placed. Restoration works will be conducted on the surface of these terrains in order to bring the terrain to the initial state. .

Matters concerning prevention and the answer in cases of accidental pollutions:

These matters (prevention of the environmental pollution) have been covered in chapter IV.

Regarding the type of actions concerning the answer in case of accidental pollutions will be shortly described, hereunder:

A. for soil
   - the pollution source will be immediately isolated (in case of accidental losses of fuel and/or lubricants)
   - biodegradable material will be applied on the polluted area
   - after the absorption of the oily products, the absorbant will be collected and deposited in waterproof bags
   - the affected soil will be removed and deposited in waterproof bags
   - these quantities will be handed over to the authorized companies

B. for water – it is not the case

C. for air

- the pollution source will be identified (this can be traced to the emissions from a mobile source or the movement of equipment or vehicles serving the construction activity) and the cause will be analyzed
- the equipment or the vehicle will be removed until the root causes will be addressed
- in case the pollution is caused by powder emissions generated by the activity or the movement of the equipment or vehicles, the following measurements must be taken:
  - wetting of the roads or working area
  - driving at a low speed

Matters regarding the closing/dismantling/demolition of the installations:

The average lifetime of the incinerator is approximately 20 years. After this period, the functioning of the incinerator must be stopped, followed by a dismantling period, during which the initial function of the terrain must be restored. The same will happen to the electrical energy supply system. In this case, these steps must be followed:

1. cutting of the energy from the electrical energy supply system
2. dismantling of the electrical separators
3. dismantling of the light constructions
4. dismantling of the container for the temporary storage of dangerous waste
5. dismantling of the incinerator
6. all the resulted materials will be transported to a base where they will be sorted in order to establish their ulterior use

Ways to redo the initial state/restoration for subsequent use of the terrain:

Restoration works will be conducted in order to bring the terrain to the initial stat

IX. ANNEXES - DRAWINGS

1. Annex 1 – the list of dangerous waste that will be incinerated
2. Annex 2 – the list of non-dangerous waste that will be incinerated
3. situation plan;
4. site plan;

Drafted by: **SC DIVORI PREST SRL**

VolodeaFechete

The undersigned, Paşcalău Raul, certified interpreter and translator for English and French, pursuant to Authorization no. 6893/ 2002 , issued by the Ministry of Justice in Romania, hereby certify the accurate character of the translation from Romanian in English, that the text has been fully translated, without any omissions and that, by this translation, the content and meaning of this deed have not been modified.

CERTIFIED INTERPRETER AND TRANSLATOR

PAŞCALĂU RAUL