Reply to
MINISTRY OF ENVIRONMENT AND WATER BULGARIA
99-00-101
04-00-1311
27 November 2023, Sofia

I. General comments on the revised EIA report:

1. The EIA report lacks a comparison and assessment of the proposed alternatives in terms of technology chosen, location, size/scale of investment, which, based on their comparison, would confirm and determine which would be the most sustainable of them, with the least environmental impact. Claims of using the latest world technology plant do not demonstrate the suitability, efficiency and environmental friendliness of the incineration process, nor the low level of harmful emissions to the atmosphere to the extent required. The above alternatives for the implementation of the investment proposal, which are based solely on economic considerations, deprive the competent authority and the public of the right of access to the specific information needed, which also violates the principles of the Aarhus Convention.

Answer:

Romania adopted LAW No 86 of 10 May 2000 ratifying the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, signed in Aarhus on 25 June 1998. The ISSUER was the PARLIAMENT OF ROMANIA and it was published in the OFFICIAL MONITOR No 224 of 22 May 2000.

The presentation of the procedures provided for in the Romanian legislation and in the applicable guidelines, the way of analysing the alternatives as well as the way of choosing the alternative for the implementation of the project on the analysed site have been presented in Chapter 3 of the EIR on page 58.

2. The issues related to odour release as a result of project implementation, the likely sources of odour dispersion both inside and outside the site, with the potential to cause odour nuisance and disturb the quality of life of the population, are not sufficiently analysed. Aspects such as what are the possible odour-causing substances, what are the conditions conducive to their dispersion/non-dispersion, including in emergency situations, related to the operation of the facility and the temporary storage of waste, and overall within the boundaries of the site, are also not included with the necessary detail. In view of the likelihood of the presence of potential sources of emissions with a characteristic unpleasant odour, it is necessary to consider and analyse the possible directions and routes of their dispersion, and at this stage to draw up and propose a plan of additional measures so that the situations arising can be resolved as soon as possible in order to prevent the discomfort created. The clarifications made in the EIA report regarding the possible presence of odours and the need for the employer to follow certain procedures are of a wishful rather than a mandatory nature.

Answer:
These issues have been analysed e in EIR as follows:

1. The working procedures for the entire waste stream (reception, unloading, temporary storage, handling and incineration) for all waste categories were described in detail (including logical flow diagrams) as follows:

- on page 29 - The technology flow for the incineration of non-hazardous and non-hazardous animal waste:

A) <u>Technology flow for the incineration of non-hazardous and non-hazardous animal waste</u>

1. Waste reception
   - on arrival of the means of transport at the site, the accompanying documents are checked as described above
   - waste is weighed
   - the input register is completed for the type of waste received
   - no sampling of waste is required
2. Unloading of waste - this is done with a forklift. The waste bins are taken from the means of transport and temporarily stored on the concrete platform intended for this purpose. This platform is partially covered with a lightweight canopy.
3. Waste storage
   - if the non-hazardous waste does not enter the incineration stream directly, it is temporarily stored on the concrete platform specially designed for this purpose. This platform is located at the entrance to the site and has S = 35 sqm and a capacity of approx. 10 t (taking into account the storage matrix requiring access space and the relative density of the waste). Temporary storage will not exceed 24 - 48 hours.
   - If the waste is of animal origin (perishable), it is temporarily stored in cold room 1 with a storage capacity of 16 cubic metres (approx. 10 t taking into account the storage matrix which requires access space and the relative density of the waste). Animal waste that is packaged is only partially subjected to a tertiary or secondary packaging removal process if possible. This process takes place in the technical room located on the concrete platform next to the waste reception platform. The packaging waste resulting from this process is sorted and then deposited, by category for recycling, in the area designated for selective waste collection, i.e. on the concrete platform in front of the technical room.
4. From the unloading and/or temporary storage area, the waste containers are taken by the transport equipment to the incinerator area. Here the containers are unloaded into the continuous feed system of the incinerator. After unloading, the empty containers are taken to the sanitation area, i.e. the concrete platform with S = 42 m² for sanitising/disinfecting both the means of transport and the containers used to transport the waste.

From here, the sanitised containers are moved to the area at the end of the platform where they are loaded onto the transport vehicles that will take them to the waste collection points from the generators.

At least at this stage, no means of reducing the volume of packaging resulting from the unpacking of waste arriving at the site will be used. If the need for such an operation is identified at a later stage, such equipment will be purchased and installed, in compliance with the environmental procedures for both the implementation and the operational phase.

The technological flows for the incineration of non-hazardous waste and animal waste are shown below (Figures 10 and 11):

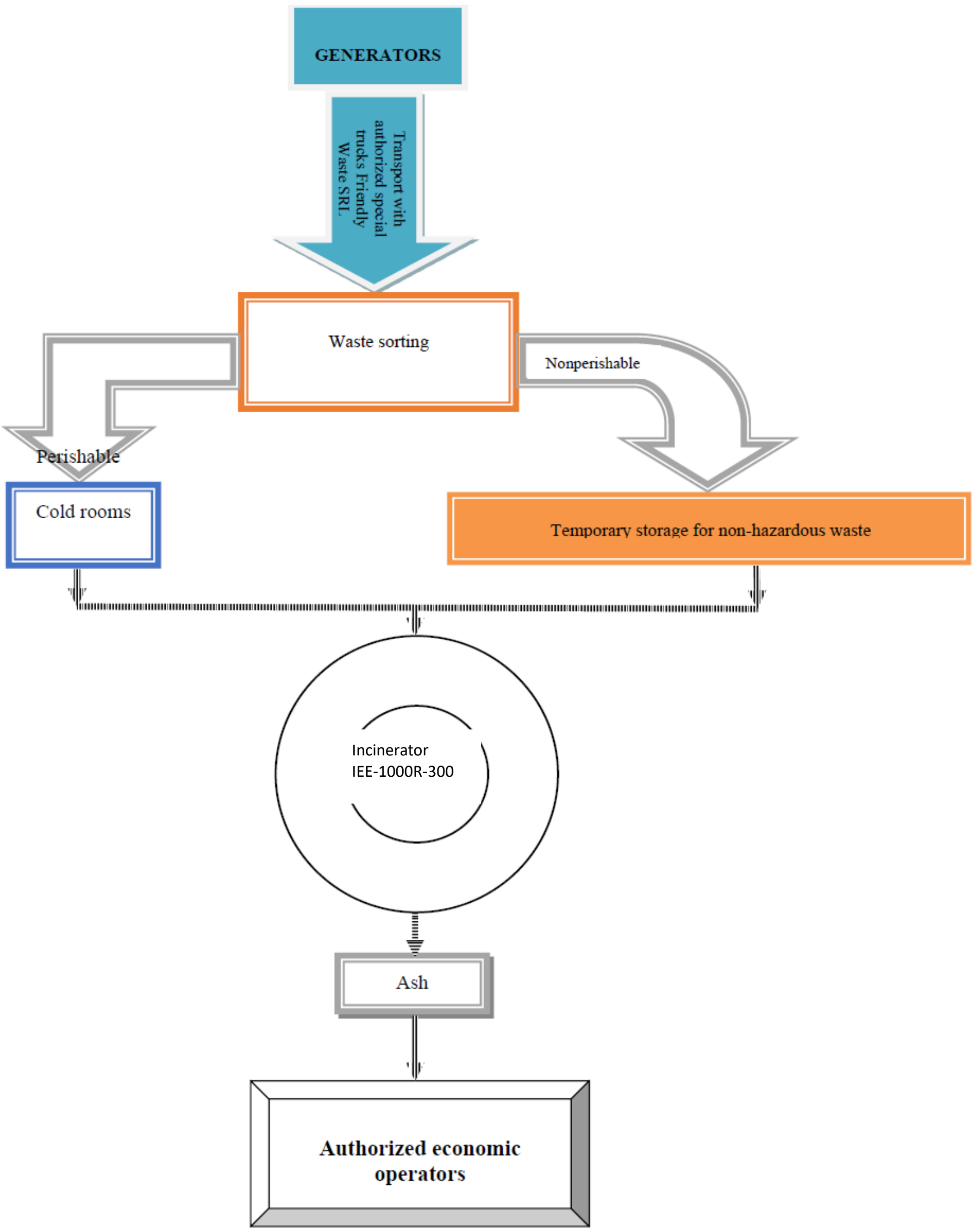

Figure 10 – Waste flow

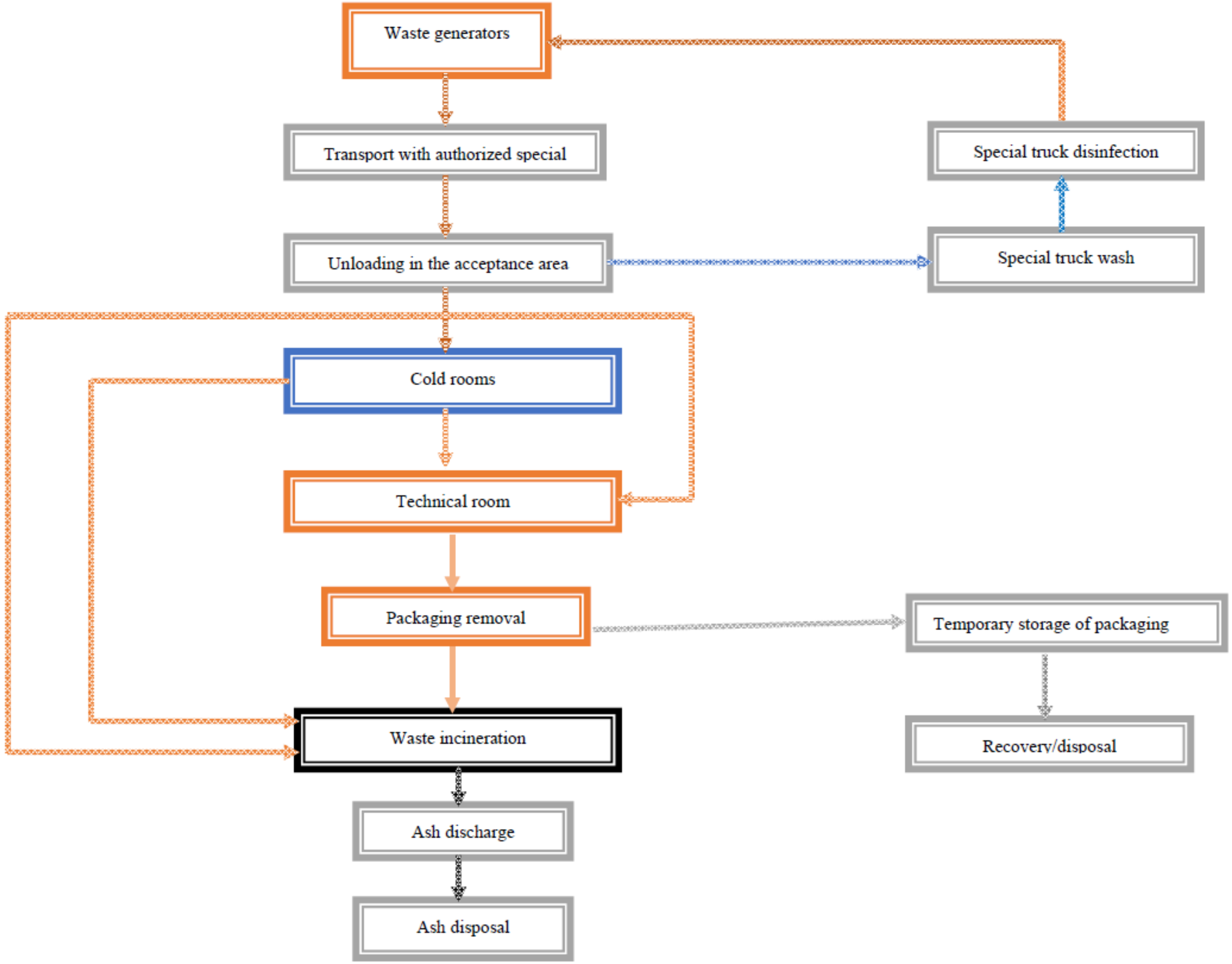

Figure 11 – Non-hazardous animal waste flow

- on page 32 - Technology flow for medical waste incineration:

B) *Technology flow for medical waste incineration*

1. Waste reception
    - on arrival of the means of transport at the site, the accompanying documents are checked
    - waste is weighed
    - the input register is completed for the type of waste received
    - sampling of medical waste is neither required nor permitted
2. Unloading the waste - this is done with a forklift or manually if it is not too heavy. The waste bins are taken from the means of transport and temporarily stored on the concrete platform in the area specially designated for this purpose. This platform is partially covered with a light canopy.
3. Waste storage - for the situation where medical waste does not go directly into the incineration stream it is temporarily stored in cold room 2. Temporary storage is carried out for a maximum of 24 - 48 hours until the incinerator is released.
4. from the unloading and/or temporary storage area the waste containers are taken by the transport machine to the incinerator area. Here the containers are unloaded into the continuous feed system of the incinerator. After unloading, the empty containers are taken to the disinfection area, i.e. the concrete platform with S = 42 m² for both sanitising/disinfecting the transport means and the containers used for transporting the waste.

From here, the disinfected containers are moved to the area at the end of the platform where they are loaded onto transport vehicles that will take them to the waste collection points from the generators.

The following clarifications are made in relation to the packaging in which medical waste is brought:

1. for hazardous medical waste - this is brought in special bags or boxes and incinerated together with the packaging in which it is brought
2. for non-hazardous medical waste:

- if it is brought in special bags for this type of waste, it is incinerated together with the packaging in which it is brought
- if they are brought in special bags placed in the bins for these types of waste, then the bins are disinfected in the area specially set aside for this process (the same area is also used for disinfecting the means of transport) located on the concrete platform at the entrance to the site, which is equipped with all the means necessary for this purpose. Disinfection is carried out with Biclosol solution, using hot water pressure washers of the Kracher type or other brands.

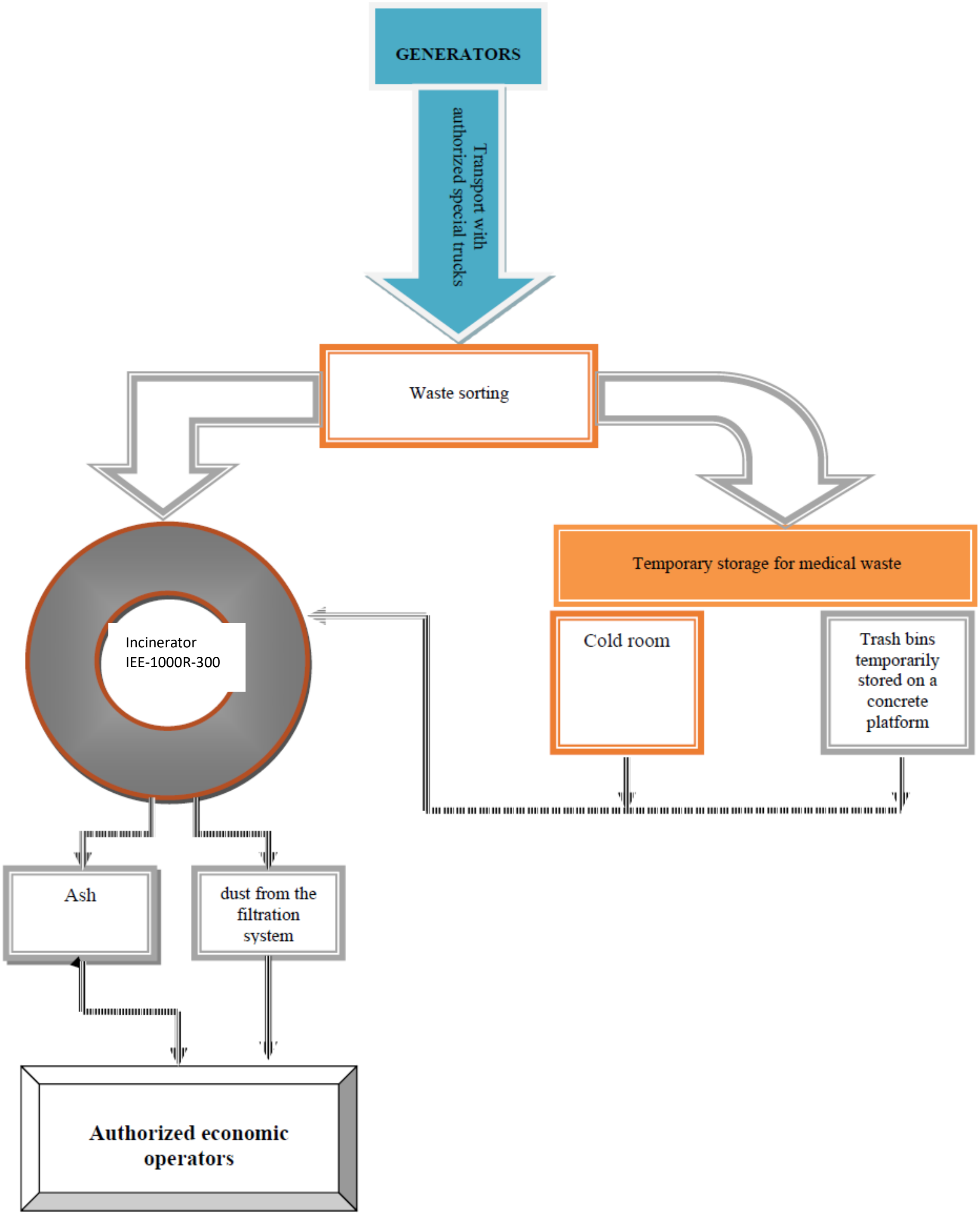

Figure 12 – Medical waste flow

- on page 36 - the procedures for implementing the provisions of the Order of the President of ANSVSA No 16/2010 approving the Sanitary Veterinary Standard on the procedure for registration/veterinary health authorisation of establishments/collection centres/holdings of origin and means of transport in the field of animal health and welfare, as amended and supplemented:

"The transport of waste will be carried out in compliance with the provisions of Government Decision no. 1076/2008 on the transport of hazardous and non-hazardous waste in Romania.

Non-hazardous animal waste (animal by-products and derived products not intended for human consumption of categories 1, 2 and 3 categorised in accordance with Regulation (EC) No 1069/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 laying down health rules concerning animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 853/2004 of the European Parliament and of the Council of 22 December 2004 laying down health rules concerning animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 853/2004 of the European Parliament and of the Council of 22 December 2004 laying down health rules concerning animal by-products and derived products not intended for human consumption) is not covered by this Regulation. 1774/2002), will be collected from generators and keepers in special containers in accordance with the provisions of the Order of the President of ANSVSA No 16/2010 approving the Sanitary Veterinary Standard on the procedure for registration/veterinary approval of establishments/collection centres/holdings of origin and means of transport in the field of animal health and welfare, as amended and supplemented (240 - 1100 l bins) and transported by the vehicles provided.

The transport of hazardous waste to be incinerated will be carried out with the trucks provided, after their authorization by the ADR, or with authorized trucks of third parties (companies authorized to collect waste of the category to be incinerated on the analyzed site)".

- on page 85 - the procedure to be followed in the event of damage leading to an emergency shutdown of the incinerator:

"In the event of a breakdown leading to an emergency shutdown of the incinerator (which is highly unlikely) the operating protocol will include the following phases:

1. when the incinerator stops suddenly (due to a malfunction) the LPG supply to the burners will automatically stop (process coordinated and controlled by the process computer-aided automation system). In this case the combustion process will also stop, which will stop the flue gas generation process.
2. the 2 combustion chambers are let to cool down
3. all the flue gases that will still be released before the combustion chambers cool down will pass through the gas scrubber and filter system and then be discharged into the atmosphere through the incinerator stack. The quantities of such gases will be very small and without impact on the environmental factor air
4. the cause of the stoppage is determined, the fault is identified and the technical measures to remedy the fault are determined. the combustion chambers (primary and/or secondary) will only be opened if absolutely necessary. Taking into account the construction and operating principle of the incinerator, it is unlikely that a fault will occur inside one of the two combustion chambers that would lead to an abrupt shutdown of the incinerator.
5. after the fault has been rectified, the condition of the system and of the entire incinerator is checked by computer diagnosis, after which the incinerator is restarted in accordance with the start-up procedure in the technical book

For situations where incinerator malfunctions occur, they will be reported in advance by the automated monitoring system, in which case the procedural steps below apply:

1. the supply of waste to the primary chamber is stopped (continuous supply system)
2. the incineration process is completed for the entire quantity of waste in the primary combustion chamber

3. the LPG supply to the combustion system in the 2 chambers of the incinerator is switched off
4. the 2 chambers of the incinerator are let to cool down
5. the fault will be identified and the technical repair solution and working procedure will be determined
6. malfunction is rectified
7. the incinerator is restarted following the start-up procedure in the technical book

In this situation, no pollutants are emitted into the atmosphere at levels above those typical of normal operation."

- on page 86 - the procedure to be followed in the event of damage to the electrical installation:

"In the event of a fault in the electricity supply to the site, the following procedural steps are taken:

- automatically starts the electric generator
- the supply of waste to the primary combustion chamber is stopped
- the incineration of existing waste in the primary chamber will be completed
- the procedure for shutting down the incinerator is initiated
- the power grid is expected to come back on
- the technical condition of the incinerator is checked and restarted following the procedural steps in the technical book.

The running time of the generator will be limited by the time of completion of the incineration of the waste in the primary chamber at that time (with the waste supply switched off) after which it will stop waiting for the power supply to return from the grid. As such the amount of exhaust gas generated will be reduced. Combined with the minimum EURO 5 pollution level of the thermal engine with which the generating set will be equipped, the quantities of pollutants emitted into the atmosphere during operation of the generating set will be very low and without significant negative impact on the environmental factor air."

2. Odour release issues as a result of project implementation were analysed in detail in the EIR as follows:

- on page 183 - very clear indications have been made regarding a possible impact on the environmental factor and on the population in the area caused by the possible presence of odours resulting from the incineration activity analysed (indications resulting from the scientific analysis carried out methodologically in the EIR):
- if all internal procedures related to the reception, temporary storage, handling and incineration of the waste analysed are followed, then no odours will be generated which would have a significant negative impact on the population
- where animal waste is to be handled, the rules on its transport from the generator to the incinerator site must be strictly observed, and a cold store must be used for its temporary storage until it is incinerated - in which case no odours will be generated which would have a significant negative impact on the population

- on pages 182-194 Conclusions on the impact of the operation of the target on the environmental factor air

"**Conclusions on the impact of the operation of the target on the environmental factor air**

The following conclusions can be drawn from the analysis of the emission values generated by the operation of the incinerator and their comparison with the permissible limit values:

- the emission values of NO_x , SO_2 , CO, solid particles of the analysed incinerator are totally negligible and are within the ELV
- the propagation distances of air pollutant concentrations (for the highest recorded wind speed = 16.9 m/s compared to the annual average speed = 6.9 m/s) are very small and well below the limit of 534 m (distance to the nearest dwelling)

Taking into account the data presented above, the following conclusions can be drawn regarding the impact of the incinerator activity on the environmental factor air:

1. the direct impact is insignificant and is manifested in a very small area that does not go beyond the boundaries of the site
2. there is no indirect or secondary impact
3. there is no significant impact in the medium or long term due to the extremely low quantities of pollutants emitted into the atmosphere and due to the air currents which contribute to their dispersion in a short time
4. the cumulative impact with the existing installations in the analysed area is insignificant (even negligible) taking into account the fact that the emissions from the incinerator activity are at totally negligible values
5. the cross-border impact is insignificant to neutral in all respects (direct, indirect, secondary, cumulative, short/medium/long term, temporary, permanent) whereas:

- the amounts of air pollutants emitted from the operation of the incinerator are low and within legal limits
- there are no areas of air pollutant propagation with exceedances of the permissible limit values for pollutant concentrations and the nearest boundary point is 3317 m from the flue gas stack of the analysed incinerator.

With regard to a possible impact on the environment and on the population in the area caused by the possible presence of odours resulting from the incineration activity analysed, we make the following clarifications:

1. if all internal procedures related to the reception, temporary storage, handling and incineration of the waste analysed are followed, then no odours will be generated which would have a significant negative impact on the population
2. where animal waste is to be handled, the rules on its transport from the generator to the incinerator site must be strictly observed, and a cold store must be used for its temporary storage until it is incinerated - in which case no odours will be generated which would have a significant negative impact on the population

Regarding emission concentration values for different averaging periods and pollutants:

1. organic substances in gaseous or vaporous state, expressed as total organic carbon (TOC) for averaging periods:
   - half an hour
   - 24 hours
2. hydrochloric acid (HCl) for mediation periods:
   - half an hour
   - 24 hours

3. Hydrofluoric acid (HF) for mediation periods:
   - half an hour
   - 24 hours
4. Total Powders (TSP) for mediation periods:
   - half an hour
   - 24 hours
5. nitrogen dioxide (NO_2) for averaging periods:
   - half an hour
   - 24 hours
6. sulphur dioxide (SO_2)
   - half an hour
   - 24 hours
7. dioxins and furans
   - 8 hours

are all below the emission limit values (ELVs) of Annex 6, Law 278/2013 both for the situation of incinerator operation with additional air supply and without additional air supply.

All actions/activities to be carried out, both in the construction and in the operation phase, will be characterised, in terms of their impact on environmental factors, by:

- duration of manifestation
  - project implementation period - very short duration
  - period of operation of the investment - short term
- frequency of occurrence
  - project implementation period - only until completion of the investment
  - period of operation of the investment - whenever there is activity on the site according to the profile
- impact reversibility
  - project implementation period - fully reversible
  - investment operating period - fully reversible

Impact on population health across borders

Centralisation of data obtained from mathematical modelling of pollutant dispersion in the atmosphere:

CARBON MONOXIDE (CO)

Table 1 - Variation of CO concentration with distance from emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Ecosystem			Obs.
						Hourly value (µg/mc)			Daily value (µg/mc)						
8 h	24 h	1 year	8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria[1]			**0.1**						10000	7000	5000				<<< VL
Ruse[2]			**0.1**												<<< VL
	Bulgaria			**0.03**											<<< VL
	Ruse			**0.03**											<<< VL
		Bulgaria			**0.001**										<<< VL
		Ruse			**0.001**										<<< VL

NO_2

Table 2 - Variation of NO_2 concentration with distance from the emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value[3] (µg/mc)			Annual value (µg/mc)						
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria			**0.4**				200			40					<<< VL
Ruse			**0.4**												<<< VL
	Bulgaria			**0.03**											<<< VL
	Ruse			**0.03**											<<< VL
		Bulgaria			**0.001**										<<< VL
		Ruse			**0.001**										<<< VL

[1] at the border with Bulgaria at a distance of 3317 m
[2] at the border of the residential area of Ruse at a distance of 3856 m
[3] European Environment Agency - Nitrogen dioxide - Annual limit values for the protection of human health

SO_x

Table 3 - Variation of SO_2 concentration with distance from emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value (µg/mc)			Daily value (µg/mc)			Annual value (µg/mc)			
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria			**0.02**			350			125	75	50	20	12	8	< LV
Ruse			**0.02**												
	Bulgaria			**0.001**											< LV
	Ruse			**0.001**											
		Bulgaria			**0.00005**										< LV
		Ruse			**0.00005**										

TSP

Table 4 - Variation of TSP concentration with distance from emission point

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc)				Human health						Ecosystem			Obs.
								Hourly value (µg/mc)			Daily value (µg/mc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0,01**				50	35	25	40	28	20				< LV
Ruse				**0,01**													
		Bulgaria				**0,0006**											< LV
		Ruse				**0,0006**											
			Bulgaria				**0.00002**										< LV
			Ruse				**0.00002**										

HCl

Table 5 - Variation of HCl concentration with distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling **(µg/mc)**		Human health						Vegetation			Obs.
				Hourly value **(mg/mc)**			Annual value (mg/mc)			(µg/mc)			
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.03**		1490	74,52	52							<<< VL
Ruse		**0.03**											<<< VL
	Bulgaria		**0,003**										<<< VL
	Ruse		**0,003**										<<< VL

According to data from the world scientific literature[4] , the following conclusions have been reached after numerous researches:

EFFECT FOR HUMAN

Single exposure

The National Research Council has reviewed the toxicological effects of HCl in humans (NRC 1987, 1991). Reports have concluded that exposure to irritating concentrations of HCl can lead to coughing, pain, inflammation, oedema and flaking in the upper respiratory tract. Acute exposure to high concentrations could cause constriction of the larynx and bronchi and closure of the glottis. Because HCl is highly irritating to the mucous surfaces of the respiratory tract and to the eyes, HCl has good warning properties.

Henderson and Haggard (1943) summarized information from several sources on the length of time various concentrations of HCl exposure could be tolerated by healthy workers and the effects that might occur (Table D-1). Matt (1889) stated in his doctoral thesis that work is impossible when inhaling air containing HCl at concentrations of 50 to 100 ppm; work is difficult but possible when the air contains concentrations of 10 to 50 ppm; and work is unworkable at 10 ppm. However, the exposure protocol used by Matt (1889) included only two individuals and three exposure concentrations. Each individual was exposed once to HCl at 10 ppm (10 min), 70 ppm (15 min) and 100 ppm (15 min). When exposed to 70 ppm, individuals left the exposure chamber once briefly during the 15-min period, and when exposed to 100 ppm, they left several times due to acute discomfort. During exposure to high concentrations, individuals experienced coughing, an increase in breathing rate and severe irritation of the throat and respiratory tract. Matt (1889) included in his report a description by another researcher of another volunteer exposed to HCl at 50 ppm for 13 minutes. Heyroth (1963) indicated in an editorial note that, in his opinion, most people can detect HCl in the air at 1-5 ppm and that 5-10 ppm is an unpleasant exposure concentration. Elkins (1959) was of the opinion that exposure to HCl at 5 ppm is immediately irritating to the nose and throat but without long-lasting effects. Sayers et al. (1934) expressed the opinion that prolonged exposure to 1-5 ppm resulted in mild symptoms, exposure to 5-10 ppm for 1 hour was the maximum exposure concentration without serious effects, and 150-200 ppm was dangerous in 30-60 min.

TABLE D-1 Interpretations of Various HCl Exposure Concentrations in the Workplace

HCl Concentration, ppm	Exposure Duration	Physiological Responses	References
1,000-2,000	Brief	Dangerous for even short exposures	Henderson and Haggard 1943
50-100	1 hr	Maximum tolerable concentration	Henderson and Haggard 1943
10-50	A few hr	Maximum tolerable concentration	Henderson and Haggard 1943
35	Unspecified short time	Irritation of throat	Henderson and Haggard 1943
10	Prolonged	Maximum allowable concentration	Henderson and Haggard 1943
1-5	—	Odor threshold	Heyroth 1963

[4] Assessment of Exposure-Response Functions for Rocket-Emission Toxicants. National Research Council (US) Subcommittee on Rocket-Emission Toxicants. Washington (DC): National Academies Press (US); 1998.

PHYSICAL AND CHEMICAL PROPERTIES

CAS No.:	7647-01-0
Molecular formula:	HCl
Molecular weight:	36.47
Chemical name:	Hydrogen chloride
Synonyms:	Muriatic acid, spirits of salt, chlorohydric acid, hydrochloric acid gas
Physical state:	Gas
Boiling point:	-84.9°C
Melting point:	-144.8°C
Vapor density:	1.26 (air = 1.0)
Vapor pressure:	40 mm Hg at 17.8°C
Solubility:	Highly soluble in water, forming hydrochloric acid (82.3 g/100 g of water at 0°C)
Color:	Colorless as a gas
Conversion factors	1 ppm = 1.49 mg/m^3 at 25°C, 1 atm:
1 mg/m^3 = 0.671 ppm	

HF

Table 6 - Variation of HF concentration versus distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.0001**		36000	20000	800							<<< VL
Ruse		**0.0001**											<<< VL
	Bulgaria		**0.00002**										<<< VL
	Ruse		**0.00002**										<<< VL

According to data from the world scientific literature[5] , the following conclusions have been reached after numerous researches:

TABLE 3–1 Summary Table of AEGL Values (ppm [mg/m³])

Classification	10 min	30 min	1 h	4 h	8 h	End Point (Reference)
AEGL-1 (Nondisabling)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	Threshold, pulmonary inflammation in humans (Lund et al. 1997, 1999)
AEGL-2 (Disabling)	95 (78)	34 (28)	24 (20)	12 (9.8)	12 (9.8)	NOAEL for lung effects in cannulated rats (Dalbey 1996; Dalbey et al. 1998a);[a] sensory irritation in dogs (Rosenholtz et al. 1963)[b]
AEGL-3 (Lethal)	170 (139)	62 (51)	44 (36)	22 (18)	22 (18)	Lethality threshold in cannulated rats (Dalbey 1996; Dalbey et al. 1998a);[c] lethality threshold in mice (Wohlslagel et al. 1976)[d]

a 10-min AEGL-2 value.

b 30-min and 1-, 4-, and 8-h AEGL-2 values.

c 10-min AEGL-3 value.

d 30-min and 1-, 4-, and 8-h AEGL-3 values.

Abbreviations: mg/m^3, milligrams per cubic meter; ppm, parts per million.

TABLE 3–2 Chemical and Physical Data for Hydrogen Fluoride

Parameter	Value	Reference
Synonyms	Hydrofluoric acid gas, anhydrous hydrofluoric acid	Budavari et al. 1996
Molecular formula	HF	Budavari et al. 1996
Molecular weight	20.01	Budavari et al. 1996
CAS Registry Number	7664–39–3	Budavari et al. 1996
Physical state	Gas	Budavari et al. 1996
Color	Colorless	Budavari et al. 1996
Solubility in water	Miscible in all proportions	Perry et al. 1994
Vapor pressure	760 mm Hg at 20°C	ACGIH 2002
Density (water=1)	1.27 at 34°C	Perry et al. 1994
Melting point	−87.7°C	Perry et al. 1994
Flammability	Not flammable	Weiss 1980
Boiling point	19.5°C	Perry et al. 1994
Conversion factors	1 ppm=0.82 mg/m^3 1 mg/m^3=1.22 ppm	ACGIH 2002

HUMAN TOXICITY DATA

2.1. Acute lethality

No data have been located on human deaths from inhalation exposure to HF alone. However, several studies indicate that humans have died from accidental exposure to hydrofluoric acid (Kleinfeld 1965; Tepperman 1980; Braun et al. 1984; Mayer and Gross 1985; Chan et al. 1987; Chela et al. 1989; ATSDR 1993). These accidents involved acute inhalation of HF in combination with dermal exposure involving severe skin damage. Deaths were attributed to pulmonary oedema and cardiac arrhythmias,

[5] Acute Exposure Guideline Levels for Selected Airborne Chemicals: Volume 4 - National Research Council (US) Subcommittee on Acute Exposure Guideline Levels Washington (DC): National Academies Press (US); 2004.

the latter being the result of acidosis due to hypocalcaemia and hypomagnesaemia pronounced following dermal fluoride absorption. Doses or exposure levels could not be determined.

2.2. Non-lethal toxicity

Ronzani (1909) and Machle et al. (1934) cite the first reports in which a HF concentration of 0.004% (40 ppm) was used in the treatment of tuberculosis. Exposure times were not specified. The sharp, irritating odour of HF is perceptible at 0.02-0.13 ppm (Sadilova et al. 1965; Perry et al. 1994).

TOC

Table 7 - Variation of TOC concentration with distance from emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.03**											
Ruse		**0.03**											
	Bulgaria		**0.001**										
	Ruse		**0.001**										

DIOXINS AND FURANS

Table 8 - Variation of PCDD & PCDF concentration with distance from emission point **(values in µg/mc x 10)$^{-6}$**

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc x 10)$^{-6}$				Human health						Ecosystem			Obs.
								Value 8 hours (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[6]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0.0003**				0.3									< LV
Ruse				**0.0003**													< LV
	Bulgaria				**0.00009**												< LV
	Ruse				**0.00007**												< LV
		Bulgaria				**0.00004**											< LV
		Ruse				**0.00003**											< LV
			Bulgaria				-										< LV
			Ruse				-										< LV

[6] there is no worldwide limit value for the concentration of dioxins and furans in immission but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

Table 9 - Variation of PCDD & PCDF concentration in relation to distance from emission point (values in pg I.TEQ/Nmc)

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (pg I.TEQ/Nmc)				Human health						Ecosystem			Obs.
								Hourly value (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[7]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0.03**				0.3									< LV
Ruse				**0.03**													< LV
	Bulgaria				**0.009**												< LV
	Ruse				**0.007**												< LV
		Bulgaria				**0.004**											< LV
		Ruse				**0.003**											< LV
			Bulgaria				-										< LV
			Ruse				-										< LV

The centralisation of the above information is presented in tabular form:

Table 10: concentration values in immission at Ruse city boundary

Pollutant	mediation period (µg/mc)			lower threshold (µg/mc)			upper threshold (µg/mc)			limit values (µg/mc)		
	1 h	8 h	24 h	1 h	8 h	24 h	1 h	8 h	24 h	1 h	8 h	24 h
CO			0.03			5000						
NO_2	0.4											
SO_X	0.02		0.001			50	200			350		
TSP	0.1		0.0006	25		20						
HCl	0.03			52×10^3								
HF	0.0001			800								
dioxins and furans **values expressed in (pg I.TEQ/Nmc)**	0,007									0.3		

[7] there is no worldwide limit value for the concentration of dioxins and furans in immission but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

- on pages 183-254 the procedures and technologies to be applied by S.C. FRIENDLY WASTE ROMÂNIA S.R.L. (in the sense of odour management and minimisation so as not to affect in any way the population in the immediate vicinity and even more the population of the Republic of Bulgaria), in full compliance with BAT requirements, were presented.

Page 183:

"With regard to a possible impact on the environment and on the population in the area caused by the possible presence of odours resulting from the incineration activity analysed, we make the following clarifications:

1. if all internal procedures related to the reception, temporary storage, handling and incineration of the waste analysed are followed, then no odours will be generated which would have a significant negative impact on the population
2. where animal waste is to be handled, the rules on its transport from the generator to the incinerator site must be strictly observed, and a cold room must be used for its temporary storage until it is incinerated - in which case no odours will be generated which would have a significant negative impact on the population".

Page 192:

"Ronzani (1909) and Machle et al. (1934) cite the first reports in which a HF concentration of 0.004% (40 ppm) was used in the treatment of tuberculosis. Exposure times were not specified. The sharp, irritating odour of HF is perceptible at 0.02-0.13 ppm (Sadilova et al. 1965; Perry et al. 1994)."

Page 218:

Table 11 - Techniques used to improve the overall environmental performance of waste incineration

	Technical	Description	Applicability
	Mixing and blending of waste	Procedures for mixing and blending waste prior to incineration include, for example, the following operations: mixing with hopper cranes - not applicable use of a power equalisation system - not applicable mixing of compatible liquid and paste waste. In some cases, solid waste is shredded before mixing - a criterion that will only be met when appropriate	It will not apply if the furnace must be directly fed for safety reasons or because of the characteristics of the waste (e.g. infectious medical waste, smelly waste or waste that is likely to release volatile substances). It will not apply in situations where undesirable reactions may occur between different types of waste (see BAT 9 f).
	Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating parameters and emissions is also included - full criterion met	Generally applicable The IR 1000-300 incinerator and the continuous monitoring system of the operating and combustion parameters with which it will be equipped fully meets this requirement.
	Optimising the incineration process	Optimization of waste feed rate, waste composition, temperature, and primary and secondary combustion air flow rates and injection points to effectively oxidize organic compounds while reducing NO_X - criterion fully met by the IR 1000-300 incinerator	Design optimisation will not apply to existing furnaces

Page 221:
"The company complies with and will enforce the provisions of the BATs for:

a) diffuse emissions

1. BAT 21. To prevent or reduce diffuse emissions from the incineration plant, including odour emissions, BAT consists of:

a) store solid waste and bulk waste in bulk that is odorous and/or likely to release volatile substances in enclosed buildings under controlled subatmospheric pressure and use the extracted air as combustion air for incineration or send it to another appropriate abatement system in case of an explosion hazard - not applicable

b) store liquid waste in tanks under appropriate controlled pressure and direct tank vents to the combustion air supply system or other suitable abatement system - not applicable

c) control the risk of odour release during complete shutdown periods when no incineration capacity is available, e.g. by:
   - sending the exhausted or extracted air to an alternative abatement system, e.g. wet scrubber, fixed adsorption bed - criterion met. The IE 1000R-300 incinerator is equipped with a dry gas scrubbing system
   - minimising the amount of waste landfilled, e.g. by stopping, reducing or transferring waste deliveries, as part of waste stream management (see BAT 9) - to be applied after obtaining the MA
   - the storage of waste in properly sealed bales - a criterion to be met only where appropriate

2. BAT 22. In order to prevent diffuse emissions of volatile compounds caused by the handling of gaseous and liquid wastes that are odorous and/or likely to release volatile substances in incineration plants, BAT consists of direct feeding into the furnace. For gaseous and liquid wastes delivered in waste containers suitable for incineration (e.g. drums), direct feeding is achieved by placing the containers directly into the furnace - criterion to be met
   They may not be applicable to sewage sludge incineration, depending for example on the water content and the need for pre-drying or mixing with other wastes.

3. BAT 23. In order to prevent or reduce diffuse dust emissions to air from the treatment of slag and hearth ash, BAT consists of the inclusion of the following elements for the management of diffuse dust emissions in the environmental management system (see BAT 1):

- identification of the most relevant sources of diffuse dust emissions (e.g. using EN 15445) - not applicable
- definition and implementation of appropriate measures and techniques to prevent or reduce diffuse emissions over a period of time - not applicable"

Page 243:

1. "**Management techniques**

Table 12 - BAT management techniques used for waste incineration activity

Technical	Description	Applicability to S.C. Friendly Waste Romania S.R.L.
Odour management plan	The odour management plan is part of the environmental management system (see BAT 1) and includes: (a) a protocol for conducting odour monitoring in accordance with EN standards (e.g. dynamic olfactometry in accordance with EN 13725 to determine odour concentration); this may be supplemented by measurement/estimation of odour exposure (e.g. in accordance with EN 16841-1 or EN 16841-2) or by estimation of odour impact; (b) a protocol for responding to identified incidents involving the release of odours, e.g. complaints; (c) an odour prevention and abatement programme designed to identify the source(s) of odours, characterise source contributions and implement prevention and/or abatement measures	To be applied in the operational phase. after obtaining the AM (Environmental permit)
Noise management plan	The noise management plan is part of the environmental management system (see BAT 1) and includes: (a) a protocol for noise monitoring; (b) a protocol for responding to identified noise incidents, e.g. complaints; (c) a noise abatement programme designed to identify the source(s), measure/estimate noise exposure, characterise the contributions of the source(s), and implement prevention and/or abatement measures.	To be applied in the operational phase. after obtaining the MA
Accident management plan	The accident management plan is part of the environmental management system (see BAT 1) and identifies the hazards posed by the installation and the associated risks and defines measures to address these risks. The plan considers the inventory of pollutants present or likely to be present which, if released, could have environmental consequences. It may be prepared using, for example, failure modes and effects analysis and/or failure modes, effects and criticality analysis. The accident management plan shall include the creation and implementation of a risk-based fire prevention, detection and control plan, which shall include the use of automatic fire detection and warning systems and manual and/or automatic fire intervention and control systems. The fire prevention, detection and control plan is relevant in particular to: waste storage and pre-treatment areas; oven loading areas; electrical control systems; bag filters; fixed adsorption beds. The accident management plan shall also include, especially for facilities receiving hazardous waste, training programmes for personnel on: explosion and fire prevention; fire fighting; knowledge of chemical hazards (labelling, carcinogens, toxicity, corrosion, fire).	To be applied in the operational phase. after obtaining the MA

Pages 247-248:

"At the same time, according to the provisions of Article 43 letter a) - "*Waste incineration plants shall meet the following conditions: a)* ***the location and establishment of the protection area shall be made following environmental and health impact studies***". For this reason, the Giurgiu Public Health Directorate has requested the preparation of a health impact study.

The conclusions of the "Study for the assessment of the impact on the health and comfort of the population" prepared by IMPACT SĂNĂTATE SRL Iași for the proposed project are as follows: "*Corroborating the previous conclusions, we consider that* ***the activities to be carried out within this investment objective will not negatively affect the comfort and health of the population in the area. We consider that the investment objective can have a positive socio-economic and administrative impact in the area****, and any negative impact on the health of the population can be avoided by complying with the conditions listed [...]* ***A perimeter curtain of trees and shrubs will be created around the site (hedge)****"*.

Consequently, the investment that will be implemented will in no way worsen the situation already existing and assumed by the inhabitants in the vicinity of the industrial platform.

Through the measures to protect the environmental factors mentioned in this study and in the study of the impact assessment on the health of the population, emissions will be below the emission limit values, odours will be perceived strictly in the area of the incinerator and site's perimeter curtain will be created from trees and shrubs. The investment will not cause discomfort to the inhabitants of Drumul Cătunului Street.

Access to the objective, both during implementation and operation, will be from Șoseaua Slobozia, without affecting the population on the eastern side of the site through traffic noise and emissions of particulate matter and exhaust gases.

If animal waste is to be handled, the rules for transporting it from the generator to the incinerator must be strictly observed and a cold room must be used for temporary storage until it is incinerated, to avoid generating odours that could have a negative impact on the population."

3.As regards the Odour Management Plan, the answer received that the issues of possible spread of unpleasant odours, health effects and mitigation measures should not be addressed in detail in the environmental impact assessment, but at a later stage, cannot be accepted, nor the reason given that "...in accordance with the legal provisions, the Odour Management Plan is drawn up at the beginning of the activity, as part of the environmental permit procedure.

Answer:

The possibility of odours causing discomfort to the population, the working procedures (at all stages and phases of the work on the site) and the measures proposed to avoid such situations were analysed . (pages: 29, 46, 183, 214, 243):

"the operator of the waste incineration plant is obliged to comply with internal procedures regarding the necessary precautionary measures for the delivery and reception of waste in order to prevent or limit, as far as possible, pollution of air, soil, surface water, groundwater and other negative effects on the environment, i.e. odours, noise and direct risks to human health".

"The treatment plant with a capacity of 417 l/h, type CN 2C is designed by DAIKI company from Japan and assembled by S.C. ASTEC ROMANIA S.R.L. The plant operates buried up to the manholes, in the vicinity of the sewage network capable of taking the flow of treated water, being designed for protection against very low temperatures but also against the emanation of unpleasant odors."

"With regard to a possible impact on the environment and on the population in the area caused by the possible presence of odours resulting from the incineration activity analysed, we make the following clarifications:

1. if all internal procedures related to the reception, temporary storage, handling and incineration of the waste analysed are followed, then no odours will be generated which would have a significant negative impact on the population
2. if animal waste is to be handled, the rules on its transport from the generator to the incinerator site shall be strictly observed and a cold room shall be used for its temporary storage until it is incinerated - in which case no odours shall be generated that would have a significant negative impact on the population".

"- for incineration plants, an accident management plan. The company will implement the necessary management techniques, i.e. draw up:

- Odour management plan
- Noise management plan
- Accident management plan

- for hearth ash treatment plants, management of diffuse dust emissions (see BAT 23) - not applicable

- an odour management plan if odour pollution is expected and/or proven to exist in sensitive areas (see section 2.4) - although this would not be the case because the site is in an area declared by the Giurgiu Local Council as an industrial area and the activity itself will not generate excessive odours the company will draw up such a plan".

	Technique	Description	Applicability
a)	Mixing and blending of waste	Procedures for mixing and blending waste prior to incineration include, for example, the following operations: • mixing with hopper cranes - not applicable • use of a power equalisation system - not applicable • mixing of compatible liquid and paste waste. In some cases, solid waste is shredded before mixing - a criterion that will only be met when appropriate	It will not apply if the furnace must be directly fed for safety reasons or because of the characteristics of the waste (e.g. infectious medical waste, smelly waste or waste that is likely to release volatile substances). It will not apply in situations where undesirable reactions may occur between different types of waste (see BAT 9 f).
b)	Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating parameters and emissions is also included - full criterion met	Generally applicable The IR 1000-300 incinerator and the continuous monitoring system of the operating and combustion parameters with which it will be equipped fully meets this requirement.

c)	Optimising the incineration process	Optimization of waste feed rate, waste composition, temperature, and primary and secondary combustion air flow rates and injection points to effectively oxidize organic compounds while reducing NO_X - criteria fully met by the IR 1000-300 incinerator	Design optimisation will not apply to existing furnaces

The company complies with and will apply the provisions of the BATs for:

b) diffuse emissions

4. BAT 21. To prevent or reduce diffuse emissions from the incineration plant, including odour emissions, BAT consists of:

d) store solid waste and bulk waste in bulk that is odorous and/or likely to release volatile substances in enclosed buildings under controlled subatmospheric pressure and use the extracted air as combustion air for incineration or send it to another appropriate abatement system in case of an explosion hazard - not applicable

e) store the liquid waste in tanks under appropriate controlled pressure and direct the tank vents to the combustion air supply system or other suitable abatement system - not applicable

f) control the risk of odour release during complete shutdown periods when no incineration capacity is available, e.g. by:
   - sending the exhausted or extracted air to an alternative abatement system, e.g. wet scrubber, fixed adsorption bed - criterion met. The IE 1000R-300 incinerator is equipped with a dry gas scrubbing system
   - minimising the amount of waste landfilled, e.g. by interrupting, reducing or transferring waste deliveries, as part of waste stream management (see BAT 9) - to be applied after obtaining the MA
   - the storage of waste in properly sealed bales - a criterion to be met only where appropriate

5. BAT 22. In order to prevent diffuse emissions of volatile compounds caused by the handling of gaseous and liquid wastes that are odorous and/or likely to release volatile substances in incineration plants, BAT consists of direct feeding into the furnace. For gaseous and liquid wastes delivered in waste containers suitable for incineration (e.g. drums), direct feeding is achieved by placing the containers directly into the furnace - criterion to be met
   They may not be applicable to sewage sludge incineration, depending for example on the water content and the need for pre-drying or mixing with other wastes.

Tecchnique	Description	Applicability to S.C. Friendly Waste Romania S.R.L.
Odour management plan	The odour management plan is part of the environmental management system (see BAT 1) and includes: (a) a protocol for carrying out odour monitoring in accordance with EN standards (e.g. dynamic olfactometry in accordance with EN 13725 to determine odour concentration); this may be supplemented by measurement/estimation of odour exposure (e.g. in accordance with EN 16841-1 or EN 16841-2) or estimation of odour impact; (b) a protocol for responding to identified incidents involving the release of odours, e.g. complaints; (c) an odour prevention and abatement programme designed to identify the source(s) of odours, characterise source contributions and implement prevention and/or abatement measures	To be applied in the operational phase. after obtaining the MA

"Through the measures to protect the environmental factors mentioned in this study and in the study of the impact assessment on the health of the population, will result in emissions below the emission limit values, odours perceived strictly in the area of the incinerator site, the perimeter curtain of the site will be made of trees and shrubs. The investment will not cause discomfort to the inhabitants of Drumul Cătunului Street.

Access to the objective, both during implementation and operation, will be from Soseaua Slobozia, without affecting the population on the eastern side of the site through traffic noise and emissions of particulate matter and exhaust gases.

If animal waste is to be handled, the rules for transporting it from the generator to the incinerator must be strictly observed and a cold room must be used for temporary storage until it is incinerated, to avoid generating odours that could have a negative impact on the population."

4. The actions to be taken in the event of an emergency situation that may arise in the event of a plant failure are described, but the necessary set of preventive measures to ensure compliance with safety requirements and reduce the risk of accidents are not addressed. Consideration should also be given to the fact that hazardous chemicals required for the operation of the facility will be stored on site permanently and in significant quantities.

Answer:
These measures and situations were presented in the EIR on pages 85, 86, 182.

Pages 85-86:
"In the event of a breakdown leading to an emergency shutdown of the incinerator (which is highly unlikely) the operating protocol will include the following phases:

1. when the incinerator stops suddenly (due to a malfunction) the LPG supply to the burners will automatically stop (process coordinated and controlled by the process computer-aided automation system). In this case the combustion process will also stop, which will stop the flue gas generation process.
2. the 2 combustion chambers are let to cool down
3. all the flue gases that will still be released before the combustion chambers cool down will pass through the gas scrubber and filter system and then be discharged into the atmosphere through the incinerator stack. The quantities of such gases will be very small

and without impact on the environmental factor air

4. the cause of the stoppage is determined, the fault is identified and the technical measures to remedy the fault are determined. the combustion chambers (primary and/or secondary) will only be opened if absolutely necessary. Taking into account the construction and operating principle of the incinerator, it is unlikely that a fault will occur inside one of the two combustion chambers that would lead to an abrupt shutdown of the incinerator.
5. after the fault has been rectified, the condition of the system and of the entire incinerator is checked by computer diagnosis, after which the incinerator is restarted in accordance with the start-up procedure in the technical book

For situations where incinerator malfunctions occur, they will be reported in advance by the automated monitoring system, in which case the procedural steps below apply:

1. the supply of waste to the primary chamber is stopped (continuous supply system)
2. the incineration process is completed for the entire quantity of waste in the primary combustion chamber
3. the LPG supply to the combustion system in the 2 chambers of the incinerator is switched off
4. the 2 chambers of the incinerator are let to cool down
5. the fault will be identified and the technical repair solution and working procedure will be determined
6. malfunction is rectified
7. the incinerator is restarted following the start-up procedure in the technical book

In this situation, no pollutants are emitted into the atmosphere at levels above those typical of normal operation."

" In the event of a fault in the electricity supply to the site, the following procedural steps are taken:

- automatically starts the electric generator
- the supply of waste to the primary combustion chamber is stopped
- the incineration of existing waste in the primary chamber will be completed
- the procedure for shutting down the incinerator is initiated
- the power grid is expected to come back on
- the technical condition of the incinerator is checked and restarted following the procedural steps in the technical book.

The running time of the generator will be limited by the time of completion of the incineration of the waste in the primary chamber at that time (with the waste supply switched off) after which it will stop waiting for the power supply to return from the grid. As such the amount of exhaust gas generated will be reduced. Combined with the minimum EURO 5 pollution level of the thermal engine with which the generating set will be equipped, the quantities of pollutants emitted into the atmosphere during operation of the generating set will be very low and without significant negative impact on the environmental factor air."

At the same time, we would like to point out that the "*necessary set of preventive measures to ensure compliance with safety requirements and reduce the risk of accidents"* is further elaborated and analysed in the environmental permit procedure.

With regard to the statement "*hazardous chemicals required for the operation of the facility will be stored on site permanently and in significant quantities*" :

- presence of LPG - on page 28 the composition of the LPG household was presented (tanks equipped with all the safety systems required by Romanian legislation) and the presence of concrete walls to protect against explosion

"*LPG household*

To provide the fuel needed to operate the incinerator, an LPG household will be built consisting of:

- 4 metal tanks with V = 5000 l
- 2 concrete wall cavities, explosion-proof and fireproof".

Page 41:

The fuels to be used are diesel and LPG and the activities where they will be used are as follows:

- LPG in the incineration of non-hazardous and medical waste;
- diesel, for transporting waste from generators to the incinerator and for handling waste with the forklift truck and for operating the generator set in case of a power failure.

The maximum quantities of fuel that can be used are:

1. waste incineration activity - LPG:
   - ➢ hourly fuel consumption
     - min. = 24.6 l/h
     - max. = 122.5 l/h
   - ➢ maximum daily operating hours = **10 hours**[8]
   - ➢ estimated daily fuel consumption:
     - minimum = **10 hours** x 24.6 l/hour = 246 l/day
     - maximum = **10 hours** x 122.5 l/hour = 1225 l/day
   - ➢ estimated annual fuel consumption
     - minimum = 246 x 320 = 78720 l/year
     - maximum = 1225 l/day x 320 days/year = 392000 l/year
     - average = 150000 l/year
2. Consumption for trucks serving the incineration of non-hazardous waste and medical waste (truck transport and forklift transport) - approx. 5 t/year

LPG will be supplied to the incinerator from tanks to be installed on site (total capacity 20,000 l) through a special piping system to transport it to the incinerator and then through the systems fitted to each burner.

LPG is supplied to the tanks by specialised tankers authorised by approved suppliers. The unloading of LPG from the tanker into the on-site tanks is carried out by means of special equipment on the tanks."

- presence of diesel fuel - it has been analysed and presented in detail in several places in the EIR that it will only be present on site in the tanks of the vehicles servicing the activity. These tanks meet all the safety standards because the vehicles will have technical inspections and technical checks carried out in accordance with the legal provisions (otherwise they cannot circulate on public roads in Romania). At the same time, the

[8] **Normally in the incinerator combustion is initiated (with LPG) when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason it has been calculated that for the operation of the incinerator for a period of 24 hours/day the LPG supply to the burners is on average only 10 hours/day.**

quantities of diesel fuel that will be present in the vehicles that will be stationed on the site analysed will be very small.

- Other hazardous chemicals required for the operation of the facility will not be present on site

5 .The EIA report does not analyse potential emergencies that may arise, including potential environmental consequences. No measures are proposed to prevent serious environmental pollution and no plan for their implementation (in the design/construction/operational phases).

Answer:

During the construction phase, no situations can arise that could lead to "*serious environmental pollution"*.

For the exploitation phase:

The EIR analyses all the potential situations of accidents that could have an impact on each environmental factor and presents the prevention and intervention methods in case of possible accidents for each environmental factor (pages 19, 52, 27,53, 74, 80, 81, 185, 186, 191).

At the same time, the ways in which the BAT provisions will be complied with in this respect were analysed (pages 192-232) .

Page 19:

"As regards the type of actions related to the response to accidental pollution, these will be briefly described below:

A. for the environmental factor soil
    - isolate the source of pollution immediately (in case of accidental loss of fuel and/or lubricants)
    - apply biodegradable absorbent material to the polluted area
    - after absorbing the petroleum product, collect the used absorbent and store it in waterproof bags
    - clean the affected soil and store it in waterproof bags
    - these quantities are delivered to authorised firms
B. for the environmental factor water - not applicable
C. for the environmental factor air
    - identify the source of the pollution (this may be emissions from a mobile source or from the movement on the road of machinery and vehicles servicing the construction activity) and analyse the cause
    - the machinery or vehicle is to be withdrawn until the causes of the emissions into the air which are likely to pollute it have been remedied
    - where pollution is caused by dust emissions from the activity or movement of machinery and/or vehicles, measures such as:
        - wetting of roads or work area
        - running at low speed"

Page 27:

"In the event of abnormal operation of the gas scrubbing system that may lead to malfunctions, the electronic monitoring system of its parameters will signal in time a potential occurrence of a malfunction and the necessary remedial measures will be taken."

Page 53:
"<u>Measures, facilities and arrangements for the protection of soil and subsoil</u>

The following measures have been foreseen to avoid soil pollution:

- the functionality of the thermal engines of the vehicles used for construction work shall be checked in due time
- no fuel and oil depots are set up in places other than those equipped in accordance with legal requirements;
- maintenance and repair work on machinery and means of transport shall be carried out only in specially designated places;
- no washing of machinery and vehicles shall be carried out on the premises, with the exception of washing for the sanitation of means of transport of non-hazardous animal waste;
- the supply of diesel and lubricants to machinery is carried out under all conditions to avoid accidental losses and to protect the environment in specially equipped places - fuel distribution stations;
- all machinery and vehicles used in the construction work and then in the incineration work run on designated roads and are parked only on concrete platforms
- waste for incineration shall be temporarily stored only in special containers in specially designated areas
- the waste from the incineration process is collected in special containers in an appropriate area".

Page 81:
"<u>Measures, facilities and arrangements for the protection of soil and subsoil</u>

The following measures have been foreseen to avoid soil pollution:

- the functionality of the thermal engines of the vehicles used for construction work shall be checked in due time
- no fuel and oil depots are set up in places other than those equipped in accordance with legal requirements;
- maintenance and repair work on machinery and means of transport shall be carried out only in specially designated places;
- no washing of machinery and vehicles shall be carried out on the premises, with the exception of washing for the sanitation of means of transport of non-hazardous animal waste;
- the supply of diesel and lubricants to machinery is carried out under all conditions to avoid accidental losses and to protect the environment, in specially equipped places - fuel distribution stations;
- all machinery and vehicles used in the construction work and then in the incineration work run on designated roads and are parked only on concrete platforms
- waste for incineration shall be temporarily stored only in special, leak-proof containers in specially designated areas
- the waste from the incineration process is collected in special containers in an appropriate area".

Page 196:
Chapter 8 of the EIR - " DESCRIPTION OF MEASURES CONSIDERED TO AVOID, PREVENT, REDUCE OR COMPENSATE FOR ANY SIGNIFICANT ADVERSE ENVIRONMENTAL EFFECTS IDENTIFIED

As shown in the previous subsections, there will be no significant environmental impact during both the implementation and operation of the investment.

However, recommendations will be made to avoid situations that could have a significant impact on some or all environmental factors. Compliance with the provisions of the regulations (opinions and agreements issued by the competent authorities in the field of environmental protection and water management) would prevent such situations from arising.

1. environmental factor air

Project implementation phase

At this stage, vehicles and machinery equipped with engines with pollution standards from EURO 4 onwards will be used.

To limit dust emissions, the tracks on the site will be wetted during very dry periods.

Project operation phase

At this stage, vehicles equipped with engines with pollution standards from EURO 5 onwards will be used for supply, waste removal, etc.

The incinerator burners are state-of-the-art with low NO_x emissions .

B. environmental factor noise and vibration

Noise protection is regulated by the "Noise Protection Regulations", indicative 1, approved by the Ministry of Transport, Construction and Tourism in 2003. In the specific project situation, noise protection is determined according to the noise curve map, drawn up according to the technical specifications of the equipment, made by the German specialist firm DEUTSCHE WINGUARD. In the above-mentioned standard, the following are mentioned:

The permissible limits of Lech equivalent noise levels outside buildings at a distance of 2.00 m from the façade and a height of 1.30 m above the ground or the level considered for protected buildings are given in the table below:

Table 13 - Permissible noise level limits near protected buildings

No. crt.	Protected building	Permissible limit of noise level dB equivalent (A)	Order number of the Cz curve corresponding
1.	Housing, hotels, hostels, guest houses	55	50
2.	Hospitals, polyclinics, dispensaries	45	40
3.	Schools	55	50
4.	Kindergartens, crèches	50	45
5.	Office buildings	65	60

Noise sources are represented by:

- machinery carrying out construction work
- means of transport participating in the construction works
- means of transporting waste for incineration
- incinerator during operation

Noise and vibration levels produced

No noise and vibration level determinations have been carried out; we can estimate that the noise level will not exceed, at the boundary of the property, the maximum value allowed by the Order of the Minister of Health no. 119/2014 approving the hygiene and public health norms concerning the living environment of the population.

C. environmental factor soil

The whole activity will be carried out on the existing concrete platforms on the site, which is a good protection to avoid soil pollution.

Possible sources of soil and subsoil pollution

Possible sources of soil pollution are:

- possible accidental spillage of fuels or lubricants from vehicles and machinery servicing the construction activity and then from specific activities during the incinerator operation phase - these spills are classified as accidental pollution
- possible accidental spillage of fuels or lubricants from the vehicles and machinery servicing the incinerator operation

Bearing in mind that the waste to be brought to the site for incineration is:

- transported in containers or bins
- by their nature these wastes do not have a liquid composition with the potential to pollute the soil
- they shall only be handled under controlled conditions by well-trained personnel
- the entire waste handling process will be carried out exclusively on concrete platforms

this waste will not be a factor in soil pollution.

Measures, facilities and arrangements for soil and subsoil protection

The following measures have been foreseen to avoid soil pollution:

- the functionality of the thermal engines of the vehicles used for construction work shall be checked in due time
- no fuel and oil depots are set up in places other than those equipped in accordance with legal requirements;
- maintenance and repair work on machinery and means of transport shall be carried out only in specially designated places;
- no washing of machinery and vehicles shall be carried out on the premises, with the exception of washing for the sanitation of means of transport of non-hazardous animal waste;
- the supply of diesel and lubricants to machinery is carried out under all conditions to avoid accidental losses and to protect the environment in specially equipped places - fuel distribution stations;
- all machinery and vehicles used in the construction work and then in the incineration work run on designated roads and are parked only on concrete platforms
- waste for incineration shall be temporarily stored only in special containers in specially designated places
- the waste from the incineration process is collected in special containers in an appropriate area.

D. environmental factor water - only groundwater is referred to as there is no surface water in the area.

Causes that may lead to potential pollution of surface water as well as groundwater, through the infiltration of pollutants into the groundwater, during the implementation of the project activity as well as during the operational phase can be related to:

- accidents in the normal operation of machinery used in construction work (crane, fork-lift truck) leading to possible accidental loss of lubricants and/or fuel
- possible accidental damage to the diesel tanks of the vehicles serving the activity
- possible accidental loss of lubricants by machinery or vehicles servicing the activity

Even in the unlikely event of having such situations considering the issues:

- all work on the site is carried out only on concrete platforms
- there are no surface waters nearby. The nearest surface water is Lake Giurgiu at a distance of 1037 m

it is virtually impossible for surface water pollution from the company's activities to occur.

In order to avoid accidental pollution of surface water and groundwater it is recommended:

- the functionality of the engines and other equipment shall be checked in good time
- the fuel tanks of the vehicles serving the activity shall be checked at all times
- a ban on the development of fuel and oil depots in places other than those that already exist and meet environmental protection standards;
- maintenance and repair work on machinery and means of transport shall be carried out only in specially designated areas outside the construction area;
- the washing of machinery on the premises is prohibited except for disinfection washing
- the supply of diesel oil and lubricants will be carried out in such a way as to avoid accidental losses and to protect the environment;
- ➢ any pollution of surface water or groundwater, regardless of the causes of its pollution, shall be immediately reported to the Buzău Basin Administration - Giurgiu Water Management System and the Giurgiu Environmental Guard.

Pages 219 - BAT provisions

Table 14- Techniques used to improve the overall environmental performance of waste incineration

	Technical	Description	Applicability
d)	Mixing and blending of waste	Procedures for mixing and blending waste prior to incineration include, for example, the following operations: • mixing with hopper cranes - not applicable • use of a power equalisation system - not applicable • mixing of compatible liquid and paste waste. In some cases, solid waste is shredded before mixing - a criterion that will only be met when appropriate	It will not apply if the furnace must be directly fed for safety reasons or because of the characteristics of the waste (e.g. infectious medical waste, smelly waste or waste that is likely to release volatile substances). It will not apply in situations where undesirable reactions may occur between different types of waste (see BAT 9 f).

e)	Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating parameters and emissions is also included - full criterion met	Generally applicable The IR 1000-300 incinerator and the continuous monitoring system of the operating and combustion parameters with which it will be equipped fully meets this requirement.
f)	Optimising the incineration process	Optimization of waste feed rate, waste composition, temperature, and primary and secondary combustion air flow rates and injection points to effectively oxidize organic compounds while reducing NO_X - criteria fully met by the IR 1000-300 incinerator	Design optimisation will not apply to existing furnaces

1. **Directed emissions into the air**

The company complies with and will apply the provisions of the BATs for:

c) **diffuse emissions**

6. BAT 21. To prevent or reduce diffuse emissions from the incineration plant, including odour emissions, BAT consists of:

g) To store solid waste and bulk waste in bulk that is odorous and/or likely to release volatile substances in enclosed buildings under controlled subatmospheric pressure and use the extracted air as combustion air for incineration or send it to another appropriate abatement system in case of an explosion hazard - not applicable

h) To store liquid waste in tanks under appropriate controlled pressure and direct tank vents to the combustion air supply system or other suitable abatement system - not applicable

i) To control the risk of odour release during complete shutdown periods when no incineration capacity is available, e.g. by:
   - sending the exhausted or extracted air to an alternative abatement system, e.g. wet scrubber, fixed adsorption bed - criterion met. The IE 1000R-300 incinerator is equipped with a dry gas scrubbing system
   - minimising the amount of waste landfilled, e.g. by stopping, reducing or transferring waste deliveries, as part of waste stream management (see BAT 9) - to be applied after obtaining the MA
   - the storage of waste in properly sealed bales - a criterion to be met only where appropriate

7. BAT 22. In order to prevent diffuse emissions of volatile compounds caused by the handling of gaseous and liquid wastes that are odorous and/or likely to release volatile substances in incineration plants, BAT consists of direct feeding into the furnace. For gaseous and liquid wastes delivered in waste containers suitable for incineration (e.g. drums), direct feeding is achieved by placing the containers directly into the furnace - criterion to be met

   They may not be applicable to sewage sludge incineration, depending for example on the water content and the need for pre-drying or mixing with other wastes.

8. BAT 23. In order to prevent or reduce diffuse dust emissions to air from the treatment of slag and hearth ash, BAT consists of the inclusion of the following elements for the management of diffuse dust emissions in the environmental management system (see BAT 1):

- identification of the most relevant sources of diffuse dust emissions (e.g. using EN 15445) - not applicable
- definition and implementation of appropriate measures and techniques to prevent or reduce diffuse emissions over a period of time - not applicable

9. BAT 24. In order to prevent or reduce diffuse dust emissions to air from the treatment of slag and hearth ash, BAT consists of using an appropriate combination of the techniques indicated below:

Table 15- techniques to prevent or reduce diffuse dust emissions to air from slag and hearth ash treatment

	Technical	**Description**	**Applicability**	**Applicability to S.C. Friendly Waste Romania S.R.L.**
a)	Equipment enclosure and covering	The use of closing devices /encapsulators for operations that produce dust (such as grinding, sieving) and/or the covering of conveyor belts and elevators. Enclosure can also be achieved by installing all equipment in an enclosed building	Installation of equipment in an enclosed building cannot apply to mobile treatment devices	This is not the case
b)	Limitation of discharge height	Matching the discharge height to the variable height of the landfill, if possible in an automated way (e.g. with height-adjustable conveyor belts)	Generally applicable	This is not the case
c)	Protecting stocks from prevailing winds	Protecting bulk storage areas or stockpiles with hedging or wind barriers such as screens, walls or vertical green spaces, and orienting stockpiles correctly to prevailing winds	Generally applicable	This is not the case
d)	Use of water spraying devices	Installation of water spraying devices at the main sources of diffuse dust emissions. Humidification of dust particles contributes to dust agglomeration and sedimentation. Diffuse dust emissions from stockpiles are reduced by ensuring adequate humidification of loading and unloading points or the stockpiles themselves.	Generally applicable	This is not the case
e)	Optimising moisture content	Optimisation of the moisture content of slag/fired ash to the level required for efficient recovery of metals and mineral materials while reducing dust emissions	Generally applicable	This is not the case

f)	Operation under subatmospheric pressure	Carrying out treatment of slag and hearth ash in closed equipment or buildings (see technique a) under subatmospheric pressure to enable the exhaust air to be treated with an abatement technique (see BAT 26) as a controlled emission	To be applied only to dry hearth ash and other low moisture hearth ash	This is not the case

BAT 30. In order to reduce airborne emissions of organic compounds - including PCDD/Fs and PCBs - from waste incineration, BAT consists of the use of techniques (a), (b), (c), (d) and one or a combination of techniques (e) to (i) below.

Table 16- BAT techniques used to reduce airborne emissions of organic compounds - including PCDD/F and PCBs - from waste incineration

Technique	**Description**	**Applicability**	**Applicability to S.C. Friendly Waste Romania S.R.L.**
Optimising the incineration process	Optimize waste feed rate, waste composition, temperature, and primary and secondary combustion air flow rates and injection points to effectively oxidize organic compounds while reducing NOX production. Optimisation of incineration parameters to promote the oxidation of organic compounds, including PCDD/F and PCBs present in the waste, and to prevent their (re-)formation and their precursors.	Generally applicable	criterion met
Waste supply control	Knowledge and control of the combustion characteristics of the waste introduced into the furnace in order to ensure optimal and, as far as possible, homogeneous and stable incineration conditions.	**It will not apply to medical waste** or municipal solid waste.	criterion met
Cleaning the boiler when it is on and when it is off	Efficient cleaning of incinerator coils to reduce stagnation time and dust accumulation in the incinerator, thus reducing PCDD/F formation in the boiler. A combination of incinerator cleaning techniques is used when incinerators are switched on and when they are switched off.	Generally applicable.	criterion met
Rapid flue gas cooling	Rapid cooling of flue gas from temperatures above 400 °C to 250 °C prior to dust reduction to prevent *de novo* synthesis of PCDD/F. This is achieved by proper boiler design and/or use of a cooling system. The latter option limits the amount of energy that can be recovered from the flue gas and is used in particular for the incineration of hazardous waste with a high halogen content.	Generally applicable	criterion met

6. With regard to the storage of hazardous chemicals and mixtures, the environmental impact assessment report states that in order to provide the necessary fuel for the operation of the incinerator, storage tanks for propane-butane - 4 tanks with a capacity of 5000 l each - will be built. Diesel fuel will also be used on site to fuel the forklifts, without specifying the storage conditions and the method of fuelling the forklifts. Propane-butane, the hazardous waste mentioned and diesel fuel are covered by Part 1 and Part 2 of Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances and amending and subsequently repealing Council Directive 96/82/EC. The contracting entity has not provided documents demonstrating compliance with the requirements of the above-mentioned legislative act, as their alleged compliance remains doubtful.

Answer:

1. The diesel required to fuel the forklift will be supplied by authorised fuel stations. The fuel will be supplied using approved metal canisters which will not be stored on the site. Since the quantities used are very small (the fork-lift truck will have a very low consumption of diesel), when necessary, the fuel will be supplied from the distribution stations and the canisters will be unloaded directly into the fork-lift truck's tank.
2. The diesel needed to power the generator set will be supplied and topped up as needed under the same conditions as for the fork-lift truck.
3. With regard to the compliance with the provisions of Law 59/2016 on the control of major-accident hazards involving dangerous substances (as subsequently amended and supplemented) which transposes the provisions of "*Part 1 and Part 2 of Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances and amending and subsequently repealing Council Directive 96/82/EC* on page 191 of the EIR it is stated that the installation under review does not fall under these provisions and that "no Major Accident Prevention Policy and/or Safety Report is required".

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Emissions into water

The company complies with and will apply the provisions of the BATs for:

a) BAT 32. To prevent contamination of uncontaminated water, reduce emissions to water and increase resource efficiency, BAT consists of separating wastewater streams and treating them separately according to their characteristics.
Description

Wastewater streams (e.g. surface water discharges, cooling water, wastewater from flue gas treatment and from the treatment of hearth ash, runoff collected from waste reception, handling and storage areas (see BAT 12 (a)) are segregated for separate treatment depending on their characteristics and the combination of treatment techniques required. Unpolluted water streams are separated from wastewater streams requiring treatment.

When recovering hydrochloric acid and/or gypsum from the scrubber effluent, the wastewater from the different stages (acid and alkaline) of the wet scrubber system is treated separately.

Applicability

Generally applicable to new installations.

Applicable to existing installations within the limits imposed by the configuration of the water catchment system.

Criteria met by S.C. Friendly Waste Romania S.R.L.

b) BAT 33. In order to reduce water use and prevent or reduce the generation of wastewater from the incineration plant, BAT consists of using one of the techniques listed below or a combination of them.

Table 17- BAT techniques to reduce water use and prevent or reduce wastewater generation from the

Technique	Description	Applicability	Applicability to S.C. Friendly Waste Romania S.R.L.
Techniques for flue gas cleaning without wastewater	Use of flue gas cleaning techniques that do not generate wastewater (e.g. injection of dry adsorbent or semi-wet adsorbent, see section 2.2).	May not be applicable for the incineration of hazardous waste with a high halogen content.	Not applicable
Injection of wastewater from flue gas cleaning techniques	Wastewater from flue gas cleaning techniques is injected into the hotter parts of the flue gas cleaning system.	It will only apply to the incineration of municipal solid waste.	Not applicable
Water reuse/recycling	Wastewater streams are reused or recycled. The degree of reuse/recycling is limited by the quality requirements of the process for which the water is intended.	Generally applicable.	Not applicable
Management of dry hearth ash	Hot dry hearth ash falls from the grate onto a conveyor system and cools in the ambient air. No water is used in the process.	Applicable only for grill ovens. There may be technical restrictions preventing upgrading of existing incineration plants.	criterion met at

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Noise

The company complies with and will enforce the provisions of the BATs:

BAT 37. In order to prevent or, if this is not possible, to reduce noise emissions, BAT consists of using one of the techniques listed below or a combination of them.

Table 18- BAT techniques applicable to prevent or, if this is not possible, reduce noise emissions

	Technique	Description	Applicability	Applicability to S.C. Friendly Waste Romania S.R.L.
a)	Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between transmitter and receiver and by using buildings as noise shields.	In the case of existing installations, relocation of equipment may be restricted by lack of space or excessive costs	Criterion met
b)	Operational measures	These include: • improved inspection and maintenance of equipment; • closing doors and windows in enclosed areas if possible; • use of equipment by experienced personnel; • avoiding noise-generating activities at night, if possible; • provisions for noise control during maintenance activities.	Generally applicable	Criteria to be met
c)	Quiet equipment	These include compressors, pumps and silent fans	It will generally apply to the replacement of existing equipment or the installation of new equipment.	Criterion met

d)	Noise attenuation	Noise propagation can be reduced by placing obstacles between the transmitter and receiver. Suitable obstacles include bulkheads, dams and buildings.	In the case of existing installations, the introduction of obstacles may be limited by lack of space	Criterion to be met
e)	Noise control equipment/ infrastructure	They are included here: • noise reducers; • equipment insulation; • the indoor location of noise-producing equipment; • sound insulation of buildings	In the case of existing installations, applicability may be limited by lack of space	Criteria met

II. Comments on environmental components and factors
Comments on the factor "waste ":

1. The environmental impact assessment report does not provide sufficiently clear information on the technology, as a result it cannot be confirmed that the specific installation has been compared with the requirements for the use of best available techniques (BAT) in accordance with Commission Implementing Decision (EU) 2019/2010 of 12 November 2019 on drawing conclusions on best available techniques (BAT) for the incineration of waste under Directive 2010/75/EU.

Answer:
During the EIR all the technology to be used as well as all the construction elements of the plant were presented and described in detail as follows:

1. pages 16-17, sub-chapter 2.2 PHYSICAL CHARACTERISTICS OF THE ENTIRE PROJECT:

"The implementation of the project involves the construction of lightweight, metal frame constructions, respectively:

- metal posts for support
- metal trusses for roof construction
- metal frames
- side walls made of fireproof sandwich panels

Light construction will be placed on foundations to be built on site. The posts will be fixed to the foundations by means of metal anchor connections which will be fixed to the concrete with anchor bolts.

The location of the incinerator and the technological annexes involves:

- making connections for fixing them to the concrete platform
- the realisation of technological lines for the fuel supply of burners
- the construction of electrical lines and connections
- location of the incinerator's construction elements

The activity to be carried out with the equipment to be installed is the incineration of non-hazardous animal and medical waste.

To determine the incineration capacity an analysis based on:

A. incineration capacity for non-hazardous animal waste
B. incineration capacity for medical waste

For both types of waste, the combustion capacity is 300 kg/h, i.e. **7.2 t/day** in continuous operation.

The incineration capacity of this type of incinerator, for the same volume of the primary combustion chamber , is given by:

- burner capacity
- waste feed rate
- rotational speed of the primary combustion chamber

Taking into account the technical characteristics of the incinerator analysed in this paper (according to the specifications in the technical book) its incineration capacity is 300 kg/h, i.e. 7.2 t/day.

The annual incineration capacity is calculated according to the hourly capacity, the daily capacity and the number of operating days/year:

0.3 t/h x 24 h = 7.2 t/day

7.2 t/day x 320 days/year = 2304 t/year

This represents the total maximum incineration capacity for all types of waste.

The division of this capacity by type of waste will depend on the availability of waste categories for incineration (hazardous or non-hazardous medical waste, non-hazardous or non-hazardous animal waste) and on the incineration programme to be carried out (strictly during the incinerator's operational phase, after obtaining the environmental permit and other permits required by the legal provisions in force).

Metal hall

It is intended to locate a hall with the following characteristics:

- foundation made of reinforced concrete blocks
- resistance structure - metal beams
- sandwich panel walls
- dimensions:
    - L = 24.68 m
    - l = 12.84 m
    - H eaves = 5 m
    - H cornice = 7,5 m
- 2-shell sandwich roof
- floor - concrete platform

Waste incinerator type IE 1000R-300

Construction features:

a) waste access room;
b) rotary, primary combustion chamber;
c) ash disposal room;
d) fixed, secondary combustion afterburner chamber;
e) supplementary air distribution system;
f) fuel distribution installation;
g) automation installation;
h) continuous and automatic waste supply system;
i) automatic ash evacuation system.

2. pages 20-34, sub-chapter 2.3. MAIN FEATURES OF THE OPERATIONAL STAGE OF THE PROJECT:

"Technical characteristics

- incineration capacity - 300 kg/h respectively 7200 kg/day in continuous operation
- fuel - LPG
- fuel consumption - 24.6 ÷ 122.5 l/h
- primary combustion chamber with the characteristics
  - primary combustion chamber volume = 10.5 m3
  - primary combustion chamber temperature - 850 C°
  - 1 burner type P 61 on LPG
- secondary combustion chamber with the characteristics
  - primary combustion chamber volume = 9.7 m3
  - primary combustion chamber temperature - 1100 C°
  - 1 burner type P 61 on LPG
  - gas retention time in the secondary combustion chamber - 2 seconds
- volume of ash resulting - 3
- measured emission parameters

Table 19- Incinerator emission parameters

Parameter	Emission limits every 30 minutes	Measured values of incinerator type IE-1000R-300
Solid particle	30 mg/m³	1.2 mg/m³
Sulphur dioxide	200 mg/m³	2.4 mg/m³
Nitrogen Dioxide*	400 mg/m³	60 mg/m³
Carbon Monoxide	100 mg/m³	78.3 mg/m³

IE 1000R-300 incinerators are equipped with state-of-the-art technology, both in terms of plant efficiency and environmental protection features.

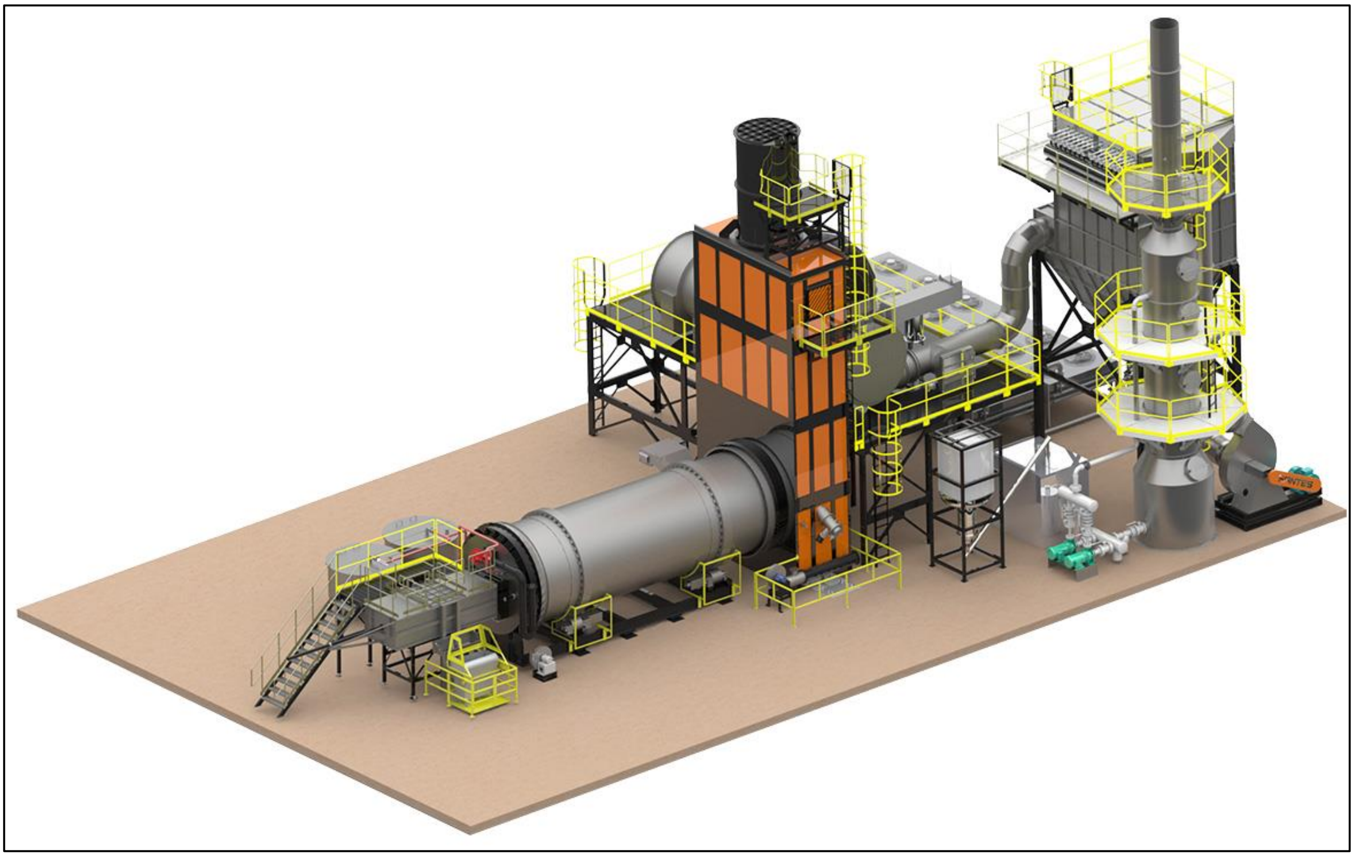


Figure 1- Incinerator overview

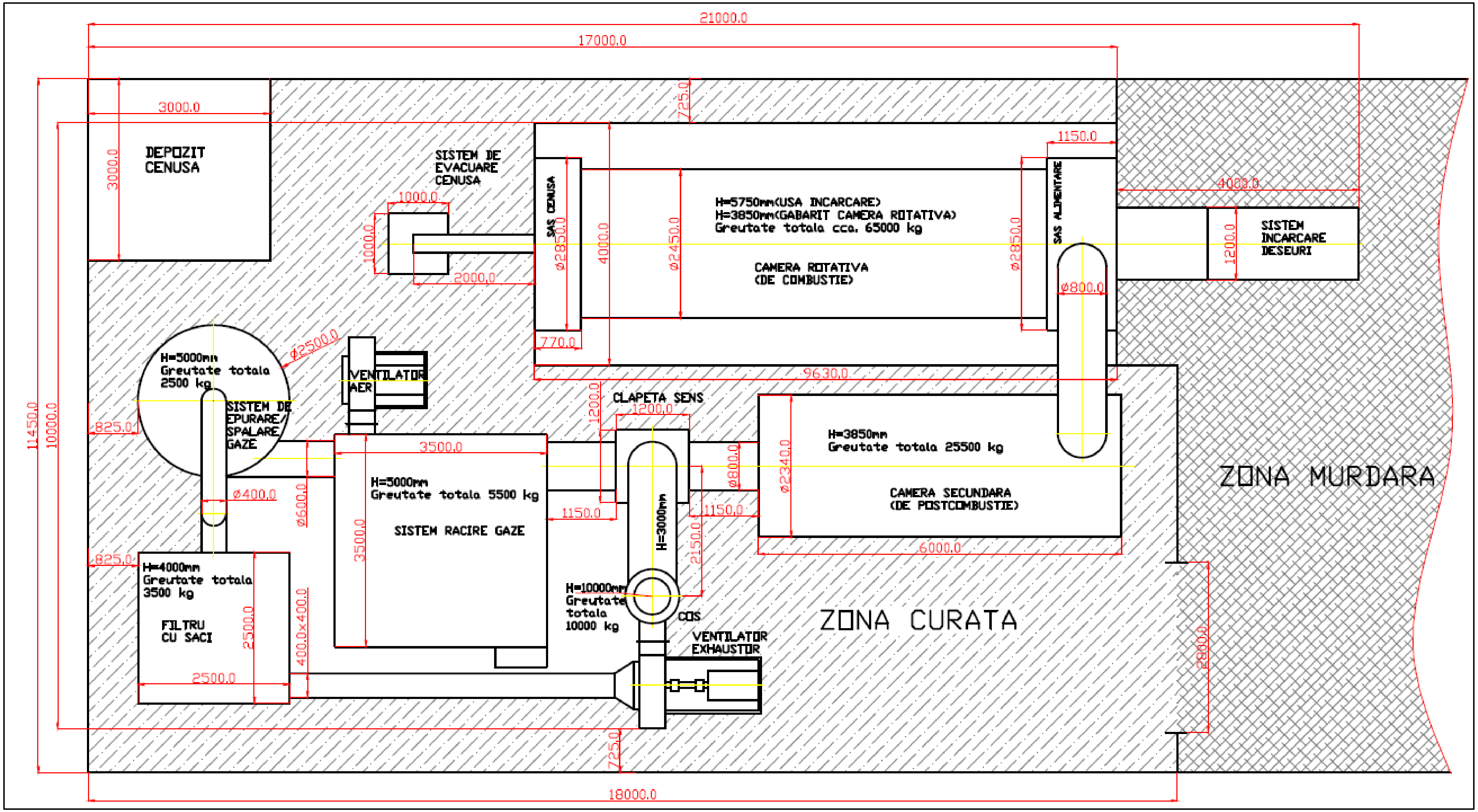


Figure 2- Layout of the location of the incinerator components with the gauge dimensions

The IE 1000R-300 is modern and innovative in terms of waste incineration efficiency. It is an incinerator model equipped with a controlled air supply system designed to ensure the best conditions for incinerating a very wide range of waste, both hazardous and non-hazardous.

<u>Presentation of the construction elements of the incinerator type IE 1000R-300</u>

According to the technical regulations, the IE 1000R-300 type environmental incinerator with two combustion chambers is equipped with two independent burners, so that the gases and suspended materials resulting from the primary combustion in the rotating combustion chamber pass into the fixed afterburner chamber, where any gases and suspended particles are retained and destroyed. The burners that equip the rotary environmental incinerator operate with LPG and are each controlled by an electronic regulator. This ensures a residence time of the combustion gases (min. 2 s, according to the legislation in force) in the fixed afterburner chamber, which results in a proper/complete combustion, ensuring that the emission values are within the limits set by the regulations in force.

The incinerator's resistance frame is made of carbon steel pipe by cutting, mechanical machining and electric welding. The configuration of the metal structure ensures:

- mechanical strength of the assembly during the execution and operation of the installation;
- access for waste loading and ash disposal;
- supporting the incinerator components.

The metal construction has provided locations for access to the burners, viewing windows and the electrical installation of the drive and automation. It is protected by painting with primer and enamel suitable for this category of machinery.

Rotary primary combustion chamber

The rotating primary combustion chamber has a volume of 10.5 m³ and is equipped with an injector to introduce additional air, thus ensuring complete and homogeneous combustion up to a temperature of 850°C. The burner in this chamber, type P 61, on LPG fuel with a consumption of (24,6 ... 122,5) l/h, is controlled by an electronic microprocessor controller and is easy to use.

The combustion chamber (primary combustion) masonry is made of refractory brick or insulating concrete, outwards and at the ends of the rotary chamber.

Fixed, secondary combustion afterburner chamber

The fixed post-combustion secondary combustion chamber has a volume of 9.7 m³, in which the complete combustion of volatile organic compounds takes place at a temperature of 1100º C, ensuring a residence time of min. 2 seconds. The burner in this chamber, type P 61, on LPG fuel with a consumption of (24,6 ... 122,5) l/h, is controlled by an electronic microprocessor controller and is easy to use.

The temperature in this room is programmable and monitored with a thermocouple. The measured temperature in the fixed afterburner chamber and the programmed temperature will be read on a digital display.

In the incineration process the gases from the primary combustion chamber will be sucked into the scrubbing area, which before being discharged, will be scrubbed and cleaned so as not to cause negative effects on the environment.

The afterburner (secondary combustion) chamber is made of brick and refractory concrete, similar to the rotary chamber.

The afterburner chamber is equipped with an emergency chimney, which in the event of a fault, allows the flue gases to be removed until the incineration of the current char has been completed.

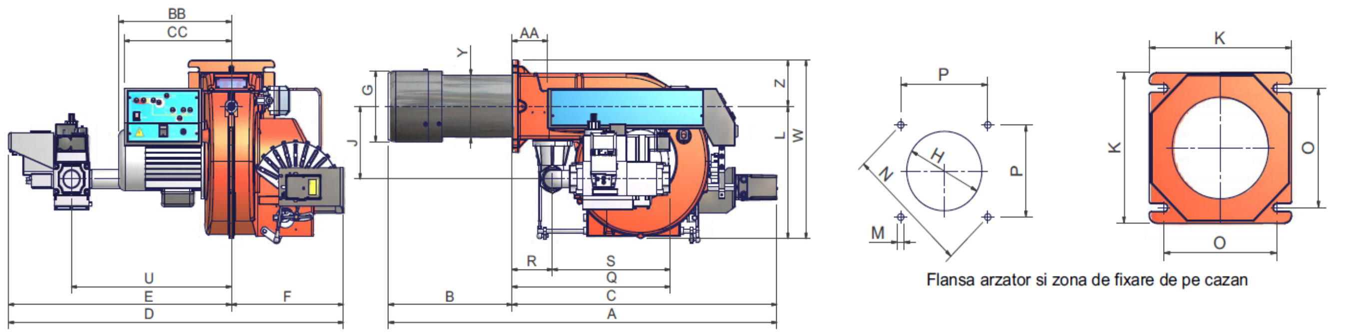
Each combustion chamber is equipped with a burner, which starts automatically when the flue gas temperature drops below 850º C or 1100º C after the last combustion air intake. These burners are also used in the start-up and shut-down phases, in order to ensure the combustion temperatures in these phases and also during the period when unburned waste is in the combustion chamber. Burners may not be fuelled with fuels which could produce emissions higher than those resulting from the combustion of petrol as referred to in Article 50(2). 3 of Directive 2010/75/EU of the European

Parliament and of the Council on industrial emissions (integrated pollution prevention and control) of 24 November 2010.

The technical characteristics of the burners used in the 2 combustion chambers are shown below:

Table 20- Technical characteristics of burners

Burner type		P61M-...0.xx	P65M- xx
Power	min. - max. kW	160- 800	270- 970
Combustible		Methane gas	Methane gas
Category		(see next paragraph)	(see next paragraph)
Gas flow	min.- max. (Nm^3/h)	17 – 84,7	28,6 - 103
Gas pressure	min.-max. mbar	(see Note 2)	(see Note 2)
Supply voltage		230V 3- / 400V 3N - 50Hz	230V 3- / 400V 3N - S0Hz
Total power consumed	kW	1,6	2
Fan motor power	kW	1.1	1,5
Degree of protection		IP40	IP40
Approx.weight	kg	55- 70	60-80
Mode of operation		Two steps - Progressive - • Completely modulating	Two steps - Progressive - • Completely modulating
Ramp type - Gas connection - 32		1"$_{1/4}$/ Rp1$_{1/}$	1"$_{1/4}$/ Rp1$_{1/}$
Ramp type - Gas connection - 40		1"$_{1/2}$/Rp1$_{1/2}$	1"$_{1/2}$/Rp1$_{1/2}$
Ramp type - Gas connection - 50		2" /Rp2	2" /Rp2
Ramp type - Gas connection - 65		2"$_{1/2}$/ DN65	2"$_{1/2}$/ DN65
Work temperature	°c	-10÷50	-10÷50
Storage temperature	°c	-20÷60	-20÷60
Operating time		Intermitent	Intermitent



	DN	A(S*)	A(L*)	AA	B(S*)	B(L*)	BB	C	CC	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	V**	W	Y	Z
P61 PR - 0.32	32	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 MD - 0.32	32	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 AB - 0.32	32	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 PR - 0.40	40	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 MD - 0.40	40	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 AB - 0.40	40	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 PR - 0.50	50	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 MD - 0.50	50	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 AB - 0.50	50	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 PR - 0.65	65	1079	1169	99	343	433	314	736	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120
P61 MD - 0.65	65	1079	1169	99	343	433	314	736	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120
P61 AB - 0.65	65	1009	1099	99	343	433	314	666	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120

Figure 3 - Burner gauge characteristics P 61

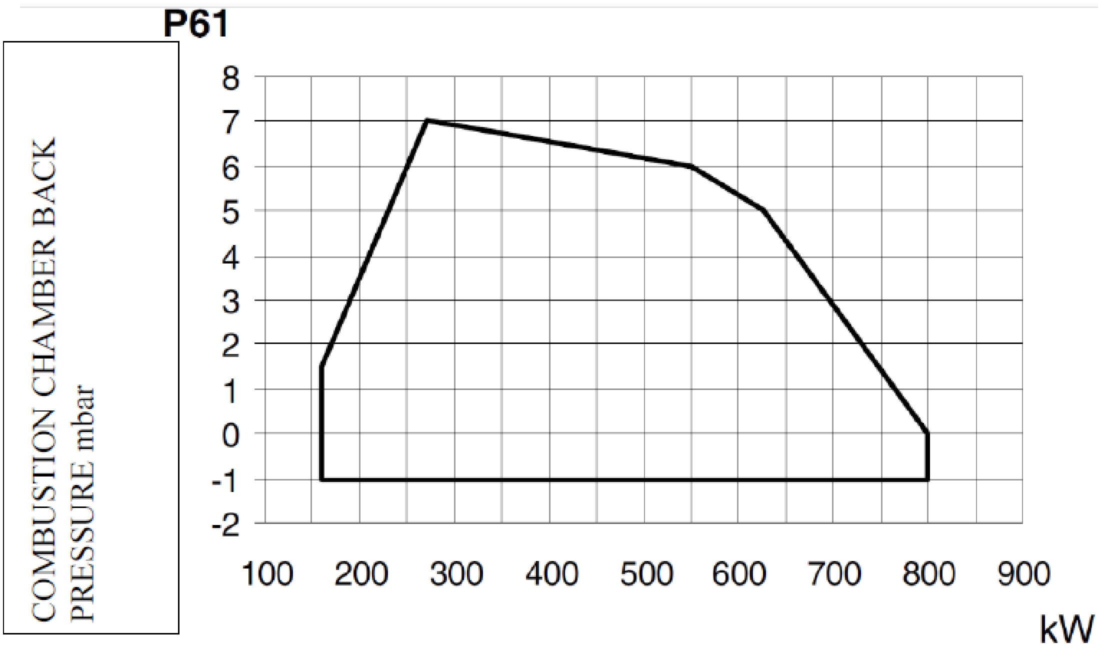


Figure 4- P61 burner performance curve for LPG fuel

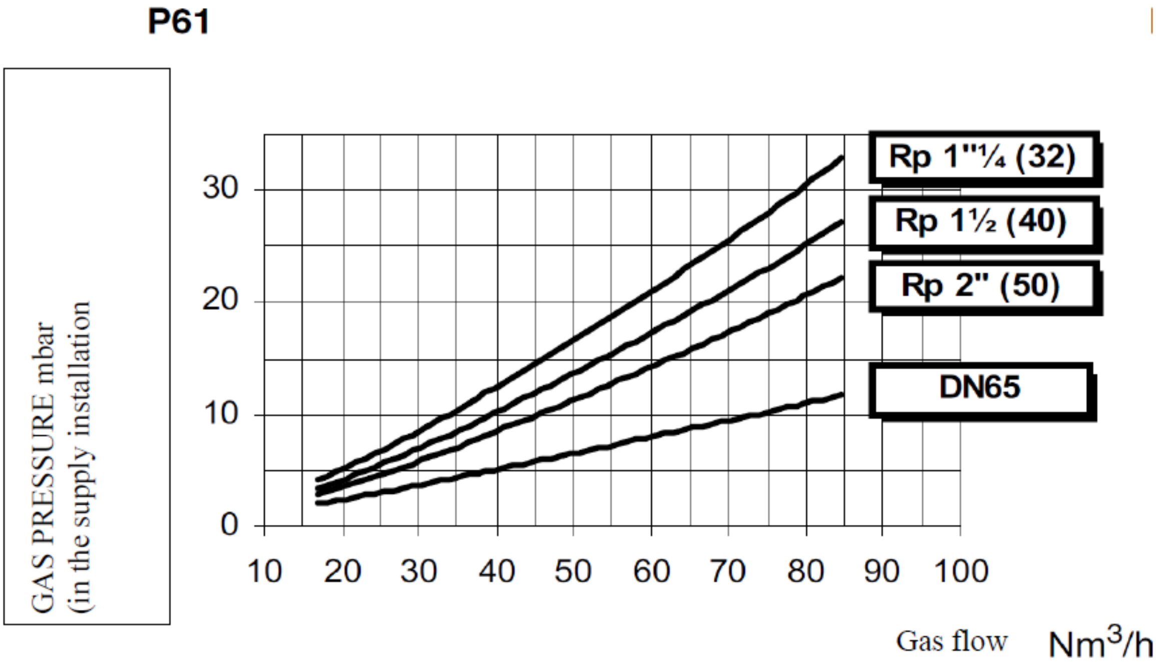


Figure 5- Installation gas pressure/gas flow curves

The burner operating parameters are continuously monitored by sensors that transmit signals to the process computer software. Any abnormalities in burner operation are immediately signalled visually and acoustically so that early action can be taken.

Supplementary air distribution system

The extra air is necessary for correct and complete combustion. The supplementary air distribution system consists of a general fan for supplementary combustion air, with the following characteristics: p = 530 mm H_2O; P = 11 KW, flow rate = 5,000 Nm^3/h, and with elements for automatic regulation of the air flow sections from the air conduction paths to the access points in the two combustion chambers and to the chimney connection (to ensure gas ejection and dilution in case of damage).

Fuel distribution installation

The fuel distribution system supplies the two burners (the rotating combustion chamber and the fixed afterburner chamber) with fuel from the distribution network via a tap connection.

Automation installation

The automation system ensures temperature regulation to the prescribed values in the two chambers, ensures correct combustion regulation and protection of the entire installation by means of safety elements and blocking the operation of the equipment in the event of failure to comply with certain operating conditions of the burners or exceeding the prescribed temperatures.

The automation system independently monitors (records and prints) the following parameters:

1. oxygen (O_2): (0 ... 21) %;
2. temperature: (0 ... 1370)°C, both in the combustion chamber and in the afterburner chamber.

Automatic adjustment of the incinerator operation is as follows:

2. the temperatures in each combustion chamber are continuously monitored:
   a. if the temperature reaches the maximum value in the soft setting, the supply of LPG to the burners in the room in question is reduced or completely stopped
   b. if the temperature reaches the maximum value in the soft setting, the supply of LPG to the burners in the room in question is reduced or completely stopped
3. the oxygen concentration is monitored and if its value falls below the minimum value in the software, the fan speed is automatically switched on or increased to provide additional air supply to the combustion chambers or the air inlet to the burners

The incinerator automation plant also contains its own memory recording system, which can be downloaded to a computer at a later date, as well as the option of card extraction and portability. This offers the possibility of printing instantaneous values at a time without downloading the entire data and ensures that data can be transmitted directly if the system is connected to a computer at the time of incineration.

Continuous and automatic waste feeding system

Incineration waste is expected to be collected and brought to the incineration facility in bins. They are placed in the loading hopper, from where they are taken by a hydraulic loading system into the feed lock, where a hydraulic piston transfers them to the primary chamber of the incinerator and thus ensures the incinerator feed rate of 300 kg/h. Waste is fed continuously, provided that occupational health and safety regulations are strictly observed.

Automatic ash removal system

Since the ecological incinerator has a primary, rotating combustion chamber, the ash is continuously drained into a box and then automatically discharged through a rotating chute into another box where it is loaded into bags. The ash is inert, non-putrescible, sterile and will be analysed for carbon and heavy metal content by specialised laboratories.

Dry" flue gas cleaning/washing system

This system includes:

a) - flue gas cooling system;
b) - dry absorbing system for flue gas cleaning;
c) - dry particle filtration system;
d) - exhaust fan for exhausting combustion gases;
e) - flue gas chimney and chimney connection.

The flue gas is introduced in a controlled and directed way into the flue gas cleaning system, of the "dry absorbing system" type, in a reactor, specially dimensioned for this purpose, where the Solvay-Bicar mixture ($NaHCO_3$ mixed with activated carbon) is injected through a nozzle. when it meets the flue gas with the sorbent in the powder phase in suspension and combines as the chemical reaction of pollutant absorption takes place, resulting in a powder which is then collected in the lower part of the reactor without the need for additional drying of the depollutant. The installation of such a system for the removal of pollutants from the flue gas by means of a dry absorbing system is designed and dimensioned to limit the discharge of pollutants and dust particles into the atmosphere in such a way as to comply with emissions into the atmosphere in accordance with the legislation in force (GD 128/2002, supplemented and updated with GD 268/2005).

In the event of abnormal operation of the gas flushing system which may lead to malfunctions, the electronic monitoring system will signal a potential malfunction in good time and the necessary corrective measures will be taken.

Following the flue gas cleaning system, the dry filter system and then the exhaust will be installed.

The dry particle filtering system is equipped with a bag filter.

Technical features are:

- filtered flow 5000 m /h^3
- filtered surface 360 m^2
- type of filter material filter bags made of FNS® (P84, glass fibre, PTFE)
- maximum operating temperature T max.(continuous) = 190° C
- pressure drop 50-150 mm H_2O.

The dry particle filtration system consists of a 144-bag filter, which is cleaned with counter current air, resulting in a filtered air flow of 10000 m³/h. This flow rate is calculated to take up the load peaks that occur when the incineration process starts. At this point any volatile fractions in the waste to be incinerated ignite almost instantaneously and generate a volume of flue gas above the working flow rate of 5000 m^3 /h. The duration of the phenomenon is very short, in the order of 1 to 5 minutes, after which the normal working flow returns.

The life of a filter bag is 6000 hours after which it must be replaced.

Exhaust gas exhauster

Technical characteristics for the exhaust gas exhauster are:

- centrifugal fan type T_{max} = 350° C (with cooling fan) with electric motor
- Suction/discharge dimensions: Ø 406 mm / 355 x 250 mm.

The exhausters' system for the flue gas discharge consists of a centrifugal fan with cooling fan, which has a flow rate of 10000 m³/h. This flow rate has been dimensioned to take up the peak loads that occur at the start of the incineration process (see paragraph above).

The advantages of this gas cleaning solution are:

<u>*Pollutant removal efficiency*</u>

- HCl > 98.0%
- SO2>98.0%
- HF>98.0%
- Hg >98.0%
- Dioxin>98.0%

<u>*Low investment costs*</u>

- It does not use water thus eliminating the problems of subsequent water treatment;
- Very low collateral energy consumption;
- There is no need to reheat the gas after treatment;
- It does not require a specialised sludge treatment plant.

Chimney (flue gas exhaust)

The combustion gases from the combustion chamber pass into the post-combustion chamber, which is provided at the bottom with an injector and which ensures that the temperature of the gases at the outlet is raised to 1100°C, in accordance with the applicable regulations in force concerning the ecological incineration of waste. The dwell time in the afterburner chamber at the above-mentioned temperature ensures the destruction of the organic components in the emission within the required limits. The flue gas outlet pipe connects the incinerator to the chimney. The chimney is made of stainless steel, thermally insulated, with a diameter of Ø 500 mm and a height of 10 m above +/- 0.00.

Cold rooms

Two cold rooms will be set up for the temporary storage of animal and medical waste. They will have the following characteristics:

- useful volume = 16 cubic metres
- dimensions 3 x 2,6 x 2 m
- working temperatures 4 ÷ 6 C°

LPG household

To provide the fuel needed to operate the incinerator, an LPG household will be built consisting of:

- 4 metal tanks with V = 5000 l
- 2 concrete wall cavities, explosion-proof and fireproof

Car park

In order to carry out its activity in good conditions, the company has purchased 4 Ford Transit trucks with a capacity of 3.5 t. They will be authorized and marked according to the legal provisions.

The incineration activity does not result in products or by-products but only in waste ash. The amount of ash resulting is a maximum of 3% of the waste incinerated."

3. pages 46-48:

"Treatment plant with a capacity of 417 l/h, type CN 2C is designed by DAIKI company from Japan and assembled by S.C. ASTEC ROMANIA S.R.L. The plant operates buried up to the manholes, in the vicinity of the sewage network capable of taking the flow of treated water, being designed for protection against very low temperatures but also against the emanation of unpleasant odours.

The station is located on 2 cylindrical tanks with a total usable volume of approximately 17 cubic meters.

The plant consists of two separation and sedimentation compartments, a biological oxidation compartment with catalytic filters and aeration produced by the blower block, a sedimentation compartment.

The great advantage over other wastewater treatment plants is the adaptable design to the needs of the beneficiary and the easy operation which only requires qualified personnel every 3 months.

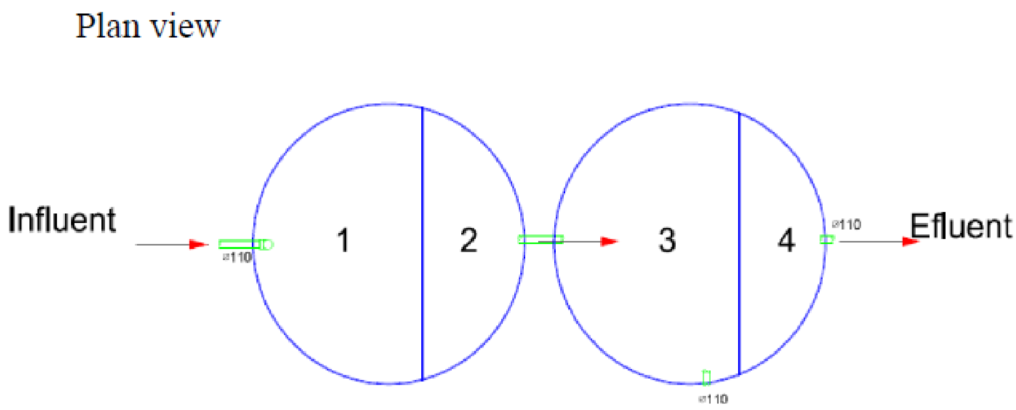


Figure 6- Schematic diagram of the technological objects of the treatment plant operation

Caption:
1 - primary decanter no. 1
2 - primary decanter no. 1
3 - aeration basin
4 - secondary decanter

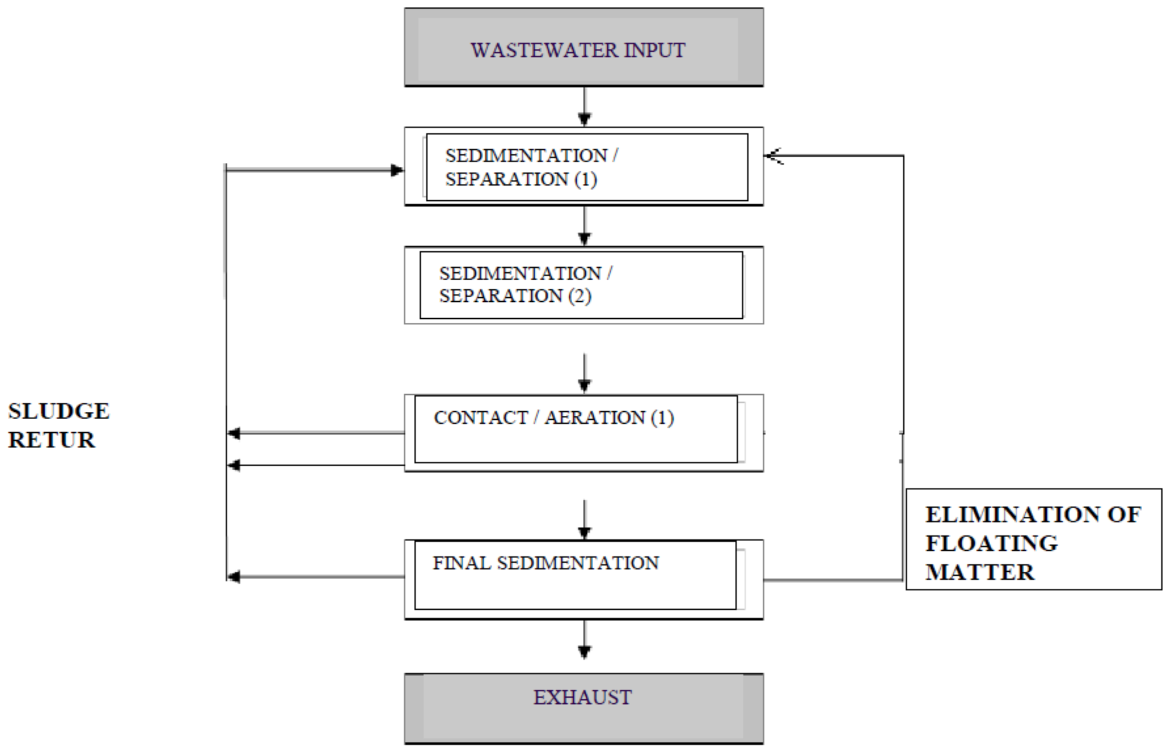


Figure 7- Schematic diagram processes of wastewater treatment plant

Description of the operation of the treatment plant:

The influent taken from the sewage network is introduced into the plant via the inlet pipe, after which it is coarse filtered to remove large bodies. Separation and sedimentation takes place gravitationally or by flotation in separation-sedimentation compartments 1 and 2, which also serve the purpose of anaerobic digestion as well as denitrification of recirculated sludge and storage of excess sludge.

Settling separation of suspended solids, including toilet paper from discharged sewage, promotes anaerobic digestion and denitrification of recirculated sludge from the final settler. The volume of the compartments and therefore the retention time of the wastewater is calculated to allow sedimentation of even very fine suspensions and storage of excess sludge for long periods of 6-12 months.

Compartment 3, with a volume equal to 0.6 - 0.8 of the average daily flow, performs aerobic digestion reduction of organic substances still in suspension through contact with microorganisms still formed on the catalytic honeycomb filters. An external blower produces aeration with an air volume large enough to optimise the biological oxidation process, proportional to the amount of BOD_5 in the treated water. Due to the phenomenon of biofilm thickening over time, which leads to a decrease in aerobic digestion efficiency, these compartments are also equipped with systems for removing excess still by removal with pressurised air and recirculation to the separation-sedimentation compartments.

Water from the sedimentation compartments is oxygenated by means of fine air bubbles supplied by diffusers and entrained in a controlled flow that uniformly washes away bacteria still on the honeycomb contact surface, so that optimal conditions for aerobic digestion are ensured.

The foam, which occurs mainly at the beginning of operation due to insufficient time for the biofilm to develop, is removed by spraying water from a shock tank located between the final decanter and the disinfection compartment, operated by an electric submersible pump whenever necessary. The sludge produced in this compartment as a result of bacteriological biodegradation, but also by regular removal of excess biofilm with the cleaning device, is recirculated by a manually operated air pump to the first sedimentation tank, where denitrification takes place with the help of anaerobic bacteria present in the active sludge.

The sedimentation compartment sediments solids from the aerobic digestion process in a volume of approximately 0.15 - 0.25 of the average daily flow. The sludge produced is recirculated to the primary compartments where the cycle is resumed.

Treated water in the contact compartment with aeration is transferred gravitationally to the final Hopper-type sloped-wall sedimentation compartment, and the supernatant is transferred to the disinfection compartment over the overflow threshold of the sawtooth spillway. Both sludge and excess foam are recirculated to the first sedimentation tank via air-driven pumps controlled by an electronic timer.

Disinfection compartment

The flow of clean water, but loaded with microorganisms, comes into contact with chlorine tablets in a device that allows the control of the contact time with the discharged water and therefore the chlorine content in the effluent. During the temporary retention in the compartment, the water is disinfected as a result of the destruction of microorganisms by the presence of chlorine, after which it is discharged by gravity or by re-pumping into the city sewer.

The only substances used are chlorine tablets (Biclosol) with an active chlorine content of 1.5 mg/tablet. Bearing in mind that 2 tablets/m^3 are recommended for the disinfection of drinking water in storage tanks and 20 tablets are used in the disinfection activity for a maximum volume of resulting industrial waste water of 10 m^3 /day so that the maximum permitted values for free residual chlorine of 0.2 mg/l discharged water are not exceeded.

The indicator values in industrial wastewater will be within the limits set in H.G. 352/2005, NTPA 001.

Technical parameters:

- Maximum flow rates allowed for influent : 10 sqm / day
- Discharge: into the sewage network of the former Giurgiu Chemical Combine, belonging to SC Delta Gas SRL
- BOD5 reduction efficiency - min. 91 %
- CCO Cr reduction yield - min. 88 %
- Reduction efficiency of suspended solids - min. 83 %
- Installed power: max. 2.5 kW, 380 V
- Service staff: 1 temporary maintenance technician"

4. pages 85-93:

"**Installations for the containment, discharge and dispersion of pollutants in the environment**

For mobile sources - all vehicles and machinery that will be used, both during the project implementation phase and in operation, will be equipped with engines with pollution levels in accordance with European standards from EURO 5 upwards.

For stationary sources - the incinerator to be installed and commissioned:

The IE 1000R-300 incinerator is equipped with:

- secondary combustion chamber with features:
  - V = 9.7 m3 equipped with 1 burner to burn the flue gases from the primary chamber
  - secondary combustion chamber temperature - 1100 C°
  - gas retention time in the secondary combustion chamber - 2 seconds
- dry absorbing flue gas cleaning/washing system comprising:
  - flue gas cooling system;
  - dry absorbing system for flue gas cleaning;
  - dry particle filtration system;
  - exhaust fan for exhausting combustion gases;
  - flue gas chimney and basket connection with features:
    - height H = 10 m
    - diameter Ø = 0,5 m
    - outlet area S = 0.196 m^2 "

2. Mechanisms for introducing and implementing procedures that improve waste stream management are not specified:

- Waste characterisation and preliminary acceptance procedures:

- *Provision is made for characterisation of waste suitable for incineration only on the basis of the documents submitted, without requiring sampling, inspection and analysis of waste prior to acceptance for incineration;*

Answer:

1. all the measures to be applied at the reception of waste on the site are described, in accordance with the Romanian legal provisions, on pages 29, 33

Page 29:

"*Technology flow for the incineration of non-hazardous and non-hazardous animal waste*

1. Waste reception
   - on arrival of the means of transport at the site, the accompanying documents are checked as described above
   - waste is weighed
   - the input register is completed for the type of waste received
   - no sampling of waste is required
2. Unloading of waste - this is done with a forklift. Waste bins are taken from the means of transport and temporarily stored on the concrete platform intended for this purpose. This platform is partially covered with a lightweight canopy.
3. Waste storage
   - if the non-hazardous waste does not enter the incineration stream directly, it is temporarily stored on the concrete platform specially designed for this purpose. This platform is located at the entrance to the site and has S = 35 sqm and a capacity of approx. 10 t (taking into account the storage matrix requiring access space and the relative density of the waste). Temporary storage will not exceed 24 - 48 hours.
   - If the waste is of animal origin (perishable), it is temporarily stored in cold room 1 with a storage capacity of 16 cubic metres (approx. 10 t taking into account the storage matrix

which requires access space and the relative density of the waste). Animal waste that is packaged is only partially subjected to a tertiary or secondary packaging removal process if possible. This process takes place in the technical room located on the concrete platform next to the waste reception platform. The packaging waste resulting from this process is sorted and then deposited, by category for recycling, in the area designated for selective waste collection, i.e. on the concrete platform in front of the technical room.

4. From the unloading and/or temporary storage area, the waste containers are taken by the transport equipment to the incinerator area. Here the containers are unloaded into the continuous feed system of the incinerator. After unloading, the empty containers are taken to the sanitation area, i.e. the concrete platform with S = 42 m² for sanitising/disinfecting both the means of transport and the containers used to transport the waste.

From here, the sanitised containers are moved to the area at the end of the platform where they are loaded onto transport vehicles that will take them to the waste collection points from the generators."

Page 32:

<u>" Technology flow for medical waste incineration</u>

1. Waste reception
   - on arrival of the means of transport at the site, the accompanying documents are checked
   - waste is weighed
   - the input register is completed for the type of waste received
   - sampling of medical waste is neither required nor permitted
2. Unloading the waste - this is done with a forklift or manually if it is not too heavy. The waste bins are taken from the means of transport and temporarily stored on the concrete platform in the area specially designated for this purpose. This platform is partially covered with a light canopy.
3. Waste storage - for the situation where medical waste does not go directly into the incineration stream it is temporarily stored in cold room 2. Temporary storage is carried out for a maximum of 24 - 48 hours until the incinerator is released.
4. from the unloading and/or temporary storage area the waste containers are taken by the transport machine to the incinerator area. Here the containers are unloaded into the continuous feed system of the incinerator. After unloading, the empty containers are taken to the disinfection area, i.e. the concrete platform with S = 42 m² for both sanitising/disinfecting the transport means and the containers used for transporting the waste.

From here, the disinfected containers are moved to the area at the end of the platform where they are loaded onto transport vehicles that will take them to the waste collection points from the generators.

The following clarifications are made in relation to the packaging in which medical waste is brought:

3. for hazardous medical waste - this is brought in special bags or boxes and incinerated together with the packaging in which it is brought
4. for non-hazardous medical waste:

- if it is brought in special bags for this type of waste, it is incinerated together with the packaging in which it is brought
- if they are brought in special bags placed in the bins for these types of waste, then the bins are disinfected in the area specially set aside for this process (the same area is also used for disinfecting the means of transport) located on the concrete platform at the entrance to the site, which is equipped with all the means necessary for this purpose. Disinfection is carried out with Biclosol solution, using hot water pressure washers of the Kracher type or other brands."

2. how the waste reception operations at the site will comply with BAT is described on pages 216-218

"BAT 11 provisions - To improve the overall environmental performance of the incineration plant, BAT consists of monitoring waste deliveries as part of the waste acceptance procedures (as per BAT 9 c), including, depending on the risk posed by the incoming waste, the items in the table below:

Table 21- Monitoring elements at waste reception

Type of waste	Monitoring waste deliveries
Municipal solid waste - not applicable Other non-hazardous waste	Radioactivity detection - not applicable Weighing of waste deliveries - criterion to be met Visual inspection - criterion to be met Regular sampling of waste deliveries and analysis of key properties/substances (e.g. calorific value, halogen and metal/metalloid content) - criterion to be met only where appropriate
Sewage sludge	Weighing of waste deliveries (or flow measurement if sewage sludge is delivered by pipeline) - not applicable Visual inspection, as far as technically feasible - criterion to be met only if applicable Regular sampling and analysis of key properties/substances (e.g. calorific value, water, ash and mercury content) - criterion to be met only where appropriate
Hazardous waste other than medical waste	Detection of radioactivity - criterion met only when appropriate Weighing of waste deliveries - criterion met Visual inspection, as far as technically possible Control of each delivery of waste and its comparison with the waste producer's declaration - not applicable Sampling from: o all tankers and trailers - not applicable o packaged waste (e.g. in drums, intermediate bulk containers (IBCs) or smaller packaging) and analysis - to be met only when appropriate o combustion parameters (including calorific value and flash point) - criterion to be met only when appropriate o compatibility of waste to detect possible hazardous reactions during mixing or blending of waste prior to landfilling (BAT 9f) - criterion to be met o key substances, including POPs, halogens and sulphur, metals/metalloids - criterion to be met only where appropriate
Medical waste	Detection of radioactivity - criterion to be met only when appropriate Weighing of waste deliveries - criterion to be met Visual inspection of packaging integrity - criterion to be met

BAT 12 provisions - To reduce the environmental risks associated with the reception, handling and storage of waste, BAT consists of using both of the techniques listed below:

Table 22- Techniques applied to reduce environmental risks associated with waste reception, handling and storage

	Technique	Description
a)	Water-resistant surfaces with adequate drainage infrastructure	○ Depending on the risks posed by the waste in terms of soil or water contamination, the surface of the waste reception, handling and storage areas shall be made impermeable to the target liquids and equipped with an appropriate drainage infrastructure (according to BAT 32) - criterion to be met - these activities shall be carried out on a concrete pad equipped with a waterproofing membrane before pouring. ○ The integrity of this surface shall be checked regularly, as far as technically possible - a criterion which shall be met
b)	Adequate waste storage capacity	Measures are taken to avoid the accumulation of this waste: ○ clear determination and not exceeding of the maximum waste storage capacity, taking into account the characteristics of the waste (e.g. in terms of fire risk) and the treatment capacity - criterion to be met ○ regular monitoring of the amount of waste landfilled in relation to the maximum permitted landfill capacity - criterion to be met ○ for waste that is not mixed during storage (e.g. medical waste, packaged waste), the maximum residence time is clearly defined - criterion to be met

Given that the only hazardous waste to be treated on site is medical waste, according to Romanian legislation, it will be handled and incinerated in special collection containers without being allowed to be opened and, as such, it will be impossible to "*sample, inspect and analyse the waste before acceptance for incineration*".

- for waste acceptance:

- *It is not clear, if waste is accepted that is found to be unsuitable for incineration, what the subsequent measures and actions will be for its management.*

Answer:
No such waste will be accepted on site.

- *There is a lack of clarity regarding the acceptance of waste from other countries, which poses the risk of receiving incorrect information on the type of waste, its suitability for incineration, the integrity of the packaging (practice shows a number of cases of acceptance of waste with false content in the accompanying documents, especially when importing or introducing waste from other countries).*

Answer:
Only waste from operators in Romania will be treated.

- *It is not clear whether the technical facility is designed only for these types of waste. In this respect, it is not explicitly stated whether it is envisaged that other types of hazardous and/or non-hazardous waste for incineration can be added to the plant in the future and whether the plant will be able to be loaded according to the designed capacity.*

Answer:
In the EU and Romania incinerators are built according to approved technical standards. These relate to how they operate and how they must comply with (among other things) safety and environmental protection rules. Modern-incinerators (which comply with the provisions of European directives and regulations in this field), such as the incinerator analysed in the EIR, are built in

compliance with these rules and not for certain categories of waste. The additional equipment (gas scrubbing plant, filtering plant, etc.) is what characterises an incineration plant for which types of waste it can be used.

In the EIR it was highlighted that only those categories of waste that are listed in the tables in the paper will be incinerated in the analysed plant.

Regarding the incineration capacity (and therefore the carrying capacity) the related calculations have been presented , respectively:

pages 16, 17:

"To determine the incineration capacity an analysis will be carried out based on:

A. incineration capacity for non-hazardous animal waste
B. incineration capacity for medical waste

For both types of waste, the combustion capacity is 300 kg/h, i.e. **7.2 t/day** in continuous operation.

The incineration capacity of this type of incinerator, for the same volume of the primary combustion chamber, is given by:

- burner capacity
- waste feed rate
- rotational speed of the primary combustion chamber

Taking into account the technical characteristics of the incinerator analysed in this paper (according to the specifications in the technical book) its incineration capacity is 300 kg/h, i.e. 7.2 t/day.

The annual incineration capacity is calculated according to the hourly capacity, the daily capacity and the number of operating days/year:

0.3 t/h x 24 h = 7.2 t/day

7.2 t/day x 320 days/year = 2304 t/year

This represents the total maximum incineration capacity for all types of waste.

The division of this capacity by type of waste will depend on the availability of waste categories for incineration (hazardous or non-hazardous medical waste, non-hazardous or non-hazardous animal waste) and on the incineration programme to be carried out (strictly during the incinerator's operational phase, after obtaining the environmental permit and other permits required by the legal provisions in force).

Page 20:

"Technical features:

- incineration capacity - 300 kg/h respectively 7200 kg/day in continuous operation".

- *Operators and landfills where the ash generated in the incinerator will be transported are not indicated (if there is a prior study and/or agreement in principle from such an operator). In this respect, in order to ensure the safety of the described operations, the EIA report should contain the minimum information necessary, such as the method by which the ash generated in the incineration process (classified in the EIA with two different hazardous/non-hazardous identification codes), the transport technology, the removal routes, the risks of accidents, including the release of hazardous waste. These circumstances make it necessary at this stage for the Employer to draw up and propose an indicative programme/calendar/plan for the incineration of waste introduced into the production process, by type and quantity.*

Answer:

According to the Romanian legislation the ash resulting from the incineration of waste (under code 19 01 12) is disposed of by final disposal in authorised landfills managed by authorised economic operators (this will be the authorised local operator for the municipality of Giurgiu).

Ashes that will be classified under code 19 01 11* will be managed separately and the whole process of incineration of hazardous medical waste from which such ashes may result will be rigorously monitored. It will be handled and temporarily stored on a separate stream from the ash resulting from the incineration of non-hazardous waste. Temporary storage will be in 1100 metal containers (see pages 55-56) and will be handed over to authorised economic operators for disposal under the conditions required by legislation.

3. No actions are described on the need to monitor waste deliveries as part of the waste acceptance procedures under BAT, including checking the radioactivity of waste - a requirement for hazardous and hospital waste. The information reports "only where there is a need", which at least raises the question of the circumstances that determine the need to check the radioactivity of waste.

Answer:

1. Concerning the *"need to monitor waste deliveries"* SC FRIENDLY WASTE ROMANIA SRL will have all the necessary procedures to fulfil this aspect in the waste collection contracts concluded with each generator. At the same time, there will be trained delegates from the company who will monitor the activities of waste collection and loading at the generator and who will draw up all the required legal documents.
2. In accordance with the legal provisions in force, hospitals generating radioactive waste are obliged to strictly comply with the procedures regarding their generation, their storage in special containers provided with all the necessary technical equipment as well as those related to the handing over to authorised economic agents for their transport and disposal. SC FRIENDLY WASTE ROMANIA SRL will not take, receive or dispose of such waste by incineration .

4. On receipt of medicines and unusable chemicals (waste coded 18 01 06; 18 01 08*; 18 01 05; 18 01 07; 18 01 09; 18 02 06 and 18 02 08), there is a likelihood that hazardous packaging waste will be generated, based on the statement that some waste will be unpacked as required, which raises the question of whether waste coded 15 01 10* - packaging containing residues of hazardous substances or contaminated with hazardous substances - will be generated.*

Answer:

Only secondary and possibly tertiary packaging that does not come into direct contact with the specified waste will be treated and therefore no such waste will be generated. Primary packaging will be incinerated together with the waste.

If potential contamination of secondary packaging is observed in some batches of such waste, the unpacking operation will not be carried out and the waste will be incinerated together with all associated packaging.

5. The maximum instantaneous capacity (the physical capacity of the site to store a total amount of waste at a given time) for waste storage at the site is not indicated, which justifies the need for a description of the measures to avoid waste accumulation, given that the site will also receive waste from group 02 - Waste from agriculture (orchards, floriculture and gardening), aquaculture production, forestry, hunting and fishing, food production and processing. Under BAT, the requirement is to reduce the environmental risks associated with the reception, treatment and disposal of waste.

Answer:

Information is given in the EIR on pages 28, 29:

"*<u>Cold rooms</u>*

Two cold rooms will be set up for the temporary storage of animal and medical waste. They will have the following characteristics:

- usable volume = 16 m3/room (with a storage capacity of approx. 10 t/room, taking into account the storage matrix requiring access space and the relative density of waste)
- dimensions 3 x 2,6 x 2 m
- working temperatures 4 ÷ 6° C"

One of the rooms will be used for the temporary storage of medical waste and the other for the temporary storage of animal waste).

"Waste storage

- if the non-hazardous waste does not enter the incineration stream directly, it is temporarily stored on the concrete platform specially designed for this purpose. This platform is located at the entrance to the site and has S = 35 sqm and a capacity of approx. 10 t (taking into account the storage matrix requiring access space and the relative density of the waste). Temporary storage will not exceed 24 - 48 hours.
- if the waste is of animal origin (perishable), it is temporarily stored in cold store No 1 with a storage capacity of 16 cubic metres (approx. 10 t taking into account the storage matrix which requires access space and the relative density of the waste)".

6. In accordance with the provisions of Article 50(3) of Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) - Directive, each combustion chamber of the waste incineration plant shall be equipped with at least one additional burner. In accordance with Article 50(4)(c) of the Directive, waste incineration plants and waste co-incineration plants shall operate an automatic system which prevents the feeding of waste whenever continuous measurements show that any of the emission limit values is exceeded due to a failure or malfunction of the waste gas treatment systems.

Answer:

1. the 2 combustion chambers of the plant under analysis are equipped with such burners which start automatically if the temperature falls below 850°C and 1,100°C respectively
2. pages 26, 27, 85, 86, 91, 190 of the EIR describe the composition of the monitoring system, the automation system, the actions and the operation of the incinerator automation and protection system in the event of a failure or if the monitoring system detects exceedances of any of the monitored parameters.

"Automation plant

The automation system ensures temperature regulation to the prescribed values in the two chambers, ensures correct combustion regulation and protection of the entire installation by means of safety elements and blocking the operation of the equipment in the event of failure to comply with certain operating conditions of the burners or exceeding the prescribed temperatures.

The automation system independently monitors (records and prints) the following parameters:

1. oxygen (O_2): (0 ... 21) %;
2. temperature: (0 ... 1370)°C, both in the combustion chamber and in the afterburner chamber.

Automatic adjustment of the incinerator operation is as follows:

1. the temperatures in each combustion chamber are continuously monitored:
   c. if the temperature reaches the maximum value in the soft setting, the supply of LPG to the burners in the room in question is reduced or completely stopped
   d. if the temperature reaches the maximum value in the soft setting, the supply of LPG to the burners in the room in question is reduced or completely stopped
2. the oxygen concentration is monitored and if its value falls below the minimum value in the software, the fan speed is automatically switched on or increased to provide additional air supply to the combustion chambers or the air inlet to the burners

The incinerator automation plant also contains its own memory recording system, which can be downloaded to a computer at a later date, as well as the option of card extraction and portability. This offers the possibility of printing instantaneous values at a time without downloading the entire data and ensures that data can be transmitted directly if the system is connected to a computer at the time of incineration.

Continuous and automatic waste feeding system

Incineration waste is expected to be collected and brought to the incineration facility in bins. They are placed in the loading hopper, from where they are taken by a hydraulic loading system into the feed lock, where a hydraulic piston transfers them to the primary chamber of the incinerator and thus ensures the incinerator feed rate of 300 kg/h. Waste is fed continuously, provided that occupational health and safety regulations are strictly observed.

Automatic ash removal system

Since the ecological incinerator has a primary, rotating combustion chamber, the ash is continuously drained into a box and then automatically discharged through a rotating chute into another box where it is loaded into bags. The ash is inert, non-putrescible, sterile and will be analysed for carbon and heavy metal content by specialised laboratories.

Dry flue gas cleaning/washing system

This system includes:

a) - flue gas cooling system;
b) - the flue gas cleaning system, of the "dry absorbing system" type;
c) - dry particle filtration system;
d) - exhaust fan for exhausting combustion gases;
e) - flue gas chimney and chimney connection.

The flue gas is introduced in a controlled and directed way into the flue gas cleaning system, of the "dry absorbing system" type, in a reactor, specially dimensioned for this purpose, where the Solvay-Bicar mixture ($NaHCO_3$ mixed with activated carbon) is injected through a nozzle. when it meets the flue gas with the sorbent in the powder phase in suspension and combines as the chemical reaction of pollutant absorption takes place, resulting in a powder which is then collected in the lower part of the reactor without the need for additional drying of the depollutant. The installation of such a system for the removal of pollutants from the flue gas by means of a dry absorbing system is designed and dimensioned to limit the discharge of pollutants and dust particles into the atmosphere in such a way as to comply with emissions into the atmosphere in accordance with the legislation in force (GD 128/2002, supplemented and updated with GD 268/2005).

In the event of abnormal operation of the gas flushing system which may lead to malfunctions, the electronic monitoring system will signal a potential malfunction in good time and the necessary corrective measures will be taken.

Following the flue gas cleaning system, the dry filter system and then the exhaust will be installed.

The dry particle filtering system is equipped with a bag filter.

Technical features are:

- filtered flow 5000 m^3 /h
- filtered surface 360 m^2
- type of filter material filter bags made of FNS® (P84, glass fibre, PTFE)
- maximum operating temperature T max.(continuous) = 190° C
- pressure drop 50-150 mm H_2O.

The dry particle filtration system consists of a 144-bag filter, which is cleaned with counter current air, resulting in a filtered air flow of 10000 m³/h. This flow rate is calculated to take up the load peaks that occur when the incineration process starts. At this point any volatile fractions in the waste to be incinerated ignite almost instantaneously and generate a volume of flue gas above the working flow rate of 5000 m^3 /h. The duration of the phenomenon is very short, in the order of 1 to 5 minutes, after which the normal working flow returns.

The life of a filter bag is 6000 hours after which it must be replaced.

Exhaust gas exhauster

Technical characteristics for the exhaust gas exhauster are:

- centrifugal fan type T_{max} = 350° C (with cooling fan) with electric motor
- Suction/discharge dimensions: Ø 406 mm / 355 x 250 mm.

The exhausters' system for the flue gas discharge consists of a centrifugal fan with cooling fan, which has a flow rate of 10000 m³/h. This flow rate has been dimensioned to take up the peak loads that occur at the start of the incineration process (see paragraph above)."

" In the event of a breakdown that leads to an emergency shutdown of the incinerator (which is highly unlikely) the operating protocol will include the following phases:

1. when the incinerator stops suddenly (due to a malfunction) the LPG supply to the burners will automatically stop (process coordinated and controlled by the process computer-aided automation system). In this case the combustion process will also stop, which will stop the flue gas generation process.
2. the 2 combustion chambers are let to cool down
3. all flue gases that will be released before the combustion chambers cool down will pass through the gas scrubber and filter system and then be discharged into the atmosphere through the incinerator stack. The quantities of such gases will be very small and will have no impact on the environmental factor air
4. the cause of the stoppage is determined, the fault is identified and the technical measures to remedy the fault are determined. the combustion chambers (primary and/or secondary) will only be opened if absolutely necessary. Taking into account the construction and operating principle of the incinerator, it is unlikely that a fault will occur inside one of the two combustion chambers that would lead to an abrupt shutdown of the incinerator.
5. after the fault has been rectified, the condition of the system and of the entire incinerator is checked by computer diagnosis, after which the incinerator is restarted in accordance with the start-up procedure in the technical book

For situations where incinerator malfunctions occur, they will be reported in advance by the automated monitoring system, in which case the procedural steps below apply:

1. the supply of waste to the primary chamber is stopped (continuous supply system)
2. the incineration process is completed for the entire quantity of waste in the primary combustion chamber
3. the LPG supply to the combustion system in the 2 chambers of the incinerator is switched off
4. the 2 chambers of the incinerator are let to cool down
5. the fault will be identified and the technical repair solution and working procedure will be determined

6. malfunction is rectified
7. the incinerator is restarted following the start-up procedure in the technical book

In this situation, no pollutants are emitted into the atmosphere at levels above those typical of normal operation.

In the event of a fault in the electricity supply to the site, the following procedural steps are taken:

- automatically starts the electric generator
- the supply of waste to the primary combustion chamber is stopped
- the incineration of existing waste in the primary chamber will be completed
- the procedure for shutting down the incinerator is initiated
- the power grid is expected to come back on
- the technical condition of the incinerator is checked and restarted following the procedural steps in the technical book.

The running time of the generator will be limited by the time of completion of the incineration of the waste in the primary chamber at that time (with the waste supply switched off) after which it will stop waiting for the power supply to return from the grid. As such the amount of exhaust gas generated will be reduced. Combined with the minimum EURO 5 pollution level of the thermal engine with which the generating set will be equipped, the quantities of pollutants emitted into the atmosphere during operation of the generating set will be very low and without significant negative impact on the environmental factor air."

"The incinerator is equipped with equipment to provide additional air for combustion, depending on the capacity of the primary combustion chamber. Thus, we have the situations:

- The IE 1000R-300 incinerator is equipped with an additional air injection system (turbine) whose operation is controlled by the automated and computerised temperature and combustion control system;
- At the same time, the injectors are also equipped with turbo blowers that ensure an increased air flow necessary for complete combustion, which are also controlled automatically. This system provides an air surplus of between 2000 and 3000 Nm^3 /h. In this case the average hourly exhaust flow will be 5000 Nm^3 /h."

Pages 90-91

"Taking into account that the IE 1000R-300 incinerator is equipped with an additional injection system (turbine) whose operation is controlled by an automated and computerized temperature and combustion control system and that the injectors are also equipped with turbo blowers that provide an increased air flow necessary for complete combustion, which are also controlled automatically, an air surplus of between 2000 and 3000 Nm^3 /h is ensured. In this case the average hourly exhaust gas flow will be 5000 Nm^3 /h in which case the concentrations of pollutants in the emissions resulting from waste incineration will be corrected by a coefficient of 0.48 (2415.88 m^3 : 5000 m^3 = 0.48**)".**

"Normally the incinerator will only operate with additional air supply because in the event of a failure in this process the automation system will initiate the shutdown sequence of the incinerator. This consists of:

1. stopping the supply of waste to the primary chamber
2. combustion control in primary chamber injectors with injector air supply
3. operation of the incinerator until all waste in the primary combustion chamber has been incinerated
4. stopping the supply of injectors
5. cooling of incinerator chambers
6. troubleshooting
7. restarting the incinerator"

Page 207:
"Facilities and measures foreseen for the control of emissions of pollutants into the environment The incinerator's facilities for controlling emissions of pollutants into the environment are:

- secondary combustion chamber - in this chamber the gases resulting from the incineration of the waste in combustion chamber 1 are burned at temperatures of 1100° C, which ensures the total removal of any pollutant compounds from the flue gas (with the exception of normal flue gas compounds - CO, CO_2 , NO_x . SO_2 , powders)
- automated temperature monitoring and control system in the 2 combustion chambers
- flue gas cleaning and filtering system after leaving the secondary combustion chamber
- flue gas exhaust basket

As this incinerator will incinerate both non-hazardous waste, animal waste and medical waste, automated systems will be installed to monitor flue gas parameters and compounds."

Page 217 (BAT techniques):

Table 23 - Combinations of techniques to reduce the environmental risk associated with the storage and handling of medical waste

	Technique	Description	applicability to S.C. Friendly Waste Romania S.R.L.
a)	Automatic or semi-automatic waste handling	Medical waste will be unloaded from the van into the storage area using an automatic or manual system, depending on the risk involved. From the storage area, medical waste will be fed into the furnace using an automatic feeding system	- criterion to be met
b)	Incineration of sealed containers that cannot be reused, if used	Medical waste will be delivered in sealed and resistant combustible containers that will never be opened during storage and handling operations. If they contain needles and sharp objects, the containers are also puncture-resistant	- criterion to be met
c)	Cleaning and disinfection of reusable containers, if used	Reusable waste containers will be cleaned in a designated cleaning area and disinfected in a facility specifically designed for disinfection. Any debris from the cleaning operations will be incinerated	- criterion to be met

BAT 14 provisions - In order to improve the overall environmental performance of waste incineration, to reduce the content of non-burning substances in slags and hearth ash and to reduce emissions to air from waste incineration, BAT consists of using an appropriate combination of the techniques set out below:

Table 24 - Techniques used to improve the overall environmental performance of waste incineration

	Technique	Description	Applicability
g)	Mixing and blending of waste	Procedures for mixing and blending waste prior to incineration include, for example, the following operations: • mixing with hopper cranes - not applicable • use of a power equalisation system - not applicable • mixing of compatible liquid and paste waste. In some cases, solid waste is shredded before mixing - a criterion that will only be met when appropriate	It will not apply if the furnace must be directly fed for safety reasons or because of the characteristics of the waste (e.g. infectious medical waste, smelly waste or waste that is likely to release volatile substances). It will not apply in situations where undesirable reactions may occur between different types of waste (see BAT 9 f).
h)	Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating	Generally applicable The IR 1000-300 incinerator and the continuous monitoring system of the operating and combustion parameters with which it will be

		parameters and emissions is also included - full criterion met	equipped fully meets this requirement.

Page 238:

"BAT 28. In order to reduce peak levels of airborne emissions of HCl, HF and SO2 from waste incineration while limiting the consumption of reagents and the amount of residues generated by the injection of dry adsorbent and semi-wet sorbents, BAT consists of using technique (a) or both techniques indicated below:

Table 25 - techniques used to reduce peak levels of airborne HCl, HF and SO2 emissions from waste incineration while limiting reagent consumption and the amount of residues generated from adsorbent injection

	Technique	Description	Applicability	Applicability to S.C. Friendly Waste Romania S.R.L.
	Optimisation and automation of reagent dosing	Use of continuous HCl and/or SO2 measurements (and/or other parameters that may be useful for this purpose) upstream and/or downstream of the flue gas cleaning system to optimise automated reagent dosing.	Generally applicable.	criterion met

Page 240:

General techniques

Table 26 - General BAT techniques used for waste incineration activity

Technique	Description
Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating parameters and emissions is also included.

Comments on the air component:

1. The pollutant dioxin: The information submitted repeatedly states that an exhaust gas cooling system will be installed, without mentioning the specific characteristics of the system, operating principle, etc. Certain technical requirements must be met: a properly designed device must be installed to reduce the flue gas temperature downstream of the secondary combustion chamber. This device must reduce the temperature of the gases leaving the secondary chamber from 1100°C to 200°C in the shortest possible time. Rapid cooling of the flue gas minimises the synthesis of new dioxins.

Answer:

The EIR does not state that a flue gas cooling system will be installed but that this system is part of the "Dry flue gas cleaning/washing system" and the "Flue gas exhaust system". This system is clearly described on pages 27, 52, 85, 91, 95.

Page 26:

"*Dry" flue gas cleaning/washing system*

This system includes:

a) - flue gas cooling system;
b) - the flue gas cleaning system, of the "dry absorbing system" type;
c) - dry particle filtration system;
d) - exhaust fan for exhausting combustion gases;
e) - flue gas chimney and chimney connection.

The flue gas is introduced in a controlled and directed way into the flue gas cleaning system, of the "dry absorbing system" type, in a reactor, specially dimensioned for this purpose, where the Solvay-Bicar mixture ($NaHCO3$ mixed with activated carbon) is injected through a nozzle. when it meets the flue gas with the sorbent in the powder phase in suspension and combines as the chemical reaction of pollutant absorption takes place, resulting in a powder which is then collected in the lower part of the reactor without the need for additional drying of the depollutant. The installation of such a system for the removal of pollutants from the flue gas by means of a dry absorbing system is designed and dimensioned to limit the discharge of pollutants and dust particles into the atmosphere in such a way as to comply with emissions into the atmosphere in accordance with the legislation in force (HG 128/2002, supplemented and updated with HG 268/2005).

In the event of abnormal operation of the gas flushing system which may lead to malfunctions, the electronic monitoring system will signal a potential malfunction in good time and the necessary remedial measures will be taken.

Following the flue gas cleaning system, the dry filter system and then the exhaust will be installed.

The dry particle filtering system is equipped with a bag filter.

Technical features are:

- filtered flow 5000 m^3 /h
- filtered surface 360 m^2
- type of filter material filter bags made of FNS® (P84, glass fibre, PTFE)
- maximum operating temperature T max.(continuous) = 190 C°
- pressure drop 50-150 mmH_2O.

The dry particle filtration system consists of a 144-bag filter, which is cleaned with counter current air, resulting in a filtered air flow of 10000 m^3/h. This flow rate is calculated to take up the load peaks that occur when the incineration process starts. At this point any volatile fractions in the waste to be incinerated ignite almost instantaneously and generate a volume of flue gas above the working flow rate of 5000 m^3 /h. The duration of the phenomenon is very short, in the order of 1 to 5 minutes, after which the normal working flow returns.

The life of a filter bag is 6000 hours after which it must be replaced.

Exhaust gas exhauster

Technical characteristics for the exhaust gas exhauster are:

- centrifugal fan type T_{max} = 350º C (with cooling fan) with electric motor
- Suction/discharge dimensions: Ø 406 mm / 355 x 250 mm.

The exhausters' system for the flue gas discharge consists of a centrifugal fan with cooling fan, which has a flow rate of 10000 m³/h. This flow rate has been dimensioned to take up the peak loads that occur at the start of the incineration process (see paragraph above)."

Page 52;

"

- dry absorbing flue gas cleaning/washing system comprising:
  - flue gas cooling system;
  - dry absorbing system for flue gas cleaning;
  - dry particle filtration system;
  - exhaust fan for exhausting combustion gases;
  - flue gas chimney and chimney connector with features:
    - height H = 10 m
    - diameter Ø = 0.5 m
    - outlet area S = 0.196 m^2 ."

Page 85:

"

- dry absorbing flue gas cleaning/washing system comprising:
  - flue gas cooling system;
  - dry absorbing system for flue gas cleaning;
  - dry particle filtration system;
  - exhaust fan for exhausting combustion gases;
  - flue gas chimney and chimney connector with features:
    - height H = 10 m
    - diameter Ø = 0,5 m
    - outlet area S = 0.196 m^2 ."

Page 95:

"

- dry absorbing flue gas cleaning/washing system comprising:
  - flue gas cooling system;
  - dry absorbing system for flue gas cleaning;
  - dry particle filtration system;
  - exhaust fan for exhausting combustion gases;
  - flue gas chimney and basket connection with features:
    - height H = 10 m
    - diameter Ø = 0,5 m
    - outlet area S = 0.196 m^2 ."

Page 221:

"

a) to control the risk of odour release during complete shutdown periods when no incineration capacity is available, e.g. by:
   - sending the exhausted or extracted air to an alternative abatement system, e.g. wet washer, fixed adsorption bed - criterion met. The IE 1000R-300 incinerator is equipped with a dry washing system of gases."

2. NOx pollutant: The data provided offers information on the burner parameters (low NOx) that are used for NOx reduction.

Answer:

The EIR details the characteristics of the burners in the incineration plant to be used on site on pages 20, 23, 24, 25, 26.

Page 20:

"Technical characteristics

- incineration capacity - 300 kg/h respectively 7200 kg/day in continuous operation
- fuel - LPG
- fuel consumption - 24.6 ÷ 122.5 l/h
- primary combustion chamber with the characteristics
  - primary combustion chamber volume = 10.5 m3
  - primary combustion chamber temperature - 850 Cº
  - <u>1 burner type P 61 on LPG</u>
- secondary combustion chamber with the characteristics
  - primary combustion chamber volume = 9,7 m3
  - primary combustion chamber temperature - 1100 Cº
  - <u>1 burner type P 61 on LPG</u>
  - gas retention time in the secondary combustion chamber - 2 seconds"

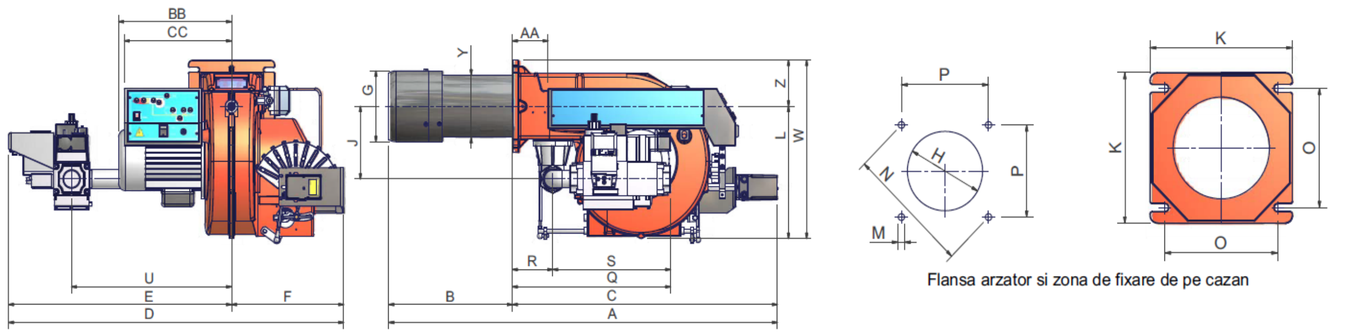
Pages 23-25:

"Each combustion chamber is equipped with a burner, which starts automatically when the flue gas temperature drops below 850º C or 1100º C after the last combustion air intake. These burners are also used in the start-up and shut-down phases, in order to ensure the combustion temperatures in these phases and also during the period when unburned waste is in the combustion chamber. Burners may not be fuelled with fuels which could produce emissions higher than those resulting from the combustion of petrol as referred to in Article 50(2). 3 of Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) of 24 November 2010.

The technical characteristics of the burners used in the 2 combustion chambers are shown below:

Table 27 - Technical characteristics of burners

Burner type		P61 M-...0.xx	P65 M- xx
Power	min. - max. kW	160- 800	270- 970
Combustible		Methane gas	Methane gas
Category		(see next paragraph)	(see next paragraph)
Gas flow	min.- max. (Nm³/h)	17 – 84,7	28,6 - 103
Gas pressure	min.-max. mbar	(see Note 2)	(see Note 2)
Supply voltage		230V 3- / 400V 3N - 50Hz	230V 3- / 400V 3N - S0Hz
Total power consumed	kW	1,6	2
Fan motor power	kW	1.1	1,5
Degree of protection		IP40	IP40
Approx.weight	kg	55- 70	60-80
Mode of operation		Two steps - Progressive - • Completely modulating	Two steps - Progressive - • Completely modulating
Ramp type - Gas connection - 32		1"$_{1/4}$/ Rp1$_{1/}$	1"$_{1/4}$/ Rp1$_{1/}$
Ramp type - Gas connection - 40		1"$_{1/2}$/Rp1$_{1/2}$	1"$_{1/2}$/Rp1$_{1/2}$
Ramp type - Gas connection - 50		2" /Rp2	2" /Rp2
Ramp type - Gas connection - 65		2"$_{1/2}$/ DN65	2"$_{1/2}$/ DN65
Work temperature	°c	-10÷50	-10÷50
Storage temperature	°c	-20÷60	-20÷60
Operating time		Intermitent	Intermitent



Flansa arzator si zona de fixare de pe cazan

	DN	A(S*)	A(L*)	AA	B(S*)	B(L*)	BB	C	CC	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	U	V**	W	Y	Z
P61 PR - 0.32	32	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 MD - 0.32	32	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 AB - 0.32	32	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	341	112	229	444	-	464	162	120
P61 PR - 0.40	40	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 MD - 0.40	40	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 AB - 0.40	40	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	439	112	327	444	-	464	162	120
P61 PR - 0.50	50	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 MD - 0.50	50	1079	1169	99	343	433	314	736	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 AB - 0.50	50	1009	1099	99	343	433	314	666	298	812	500	312	184	204	210	240	344	M10	269	190	190	447	112	335	444	-	464	162	120
P61 PR - 0.65	65	1079	1169	99	343	433	314	736	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120
P61 MD - 0.65	65	1079	1169	99	343	433	314	736	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120
P61 AB - 0.65	65	1009	1099	99	343	433	314	666	298	997	685	312	184	204	250	240	420	M10	269	190	190	515	112	403	540	313	540	162	120

Figure 8 - Burner gauge characteristics P 61

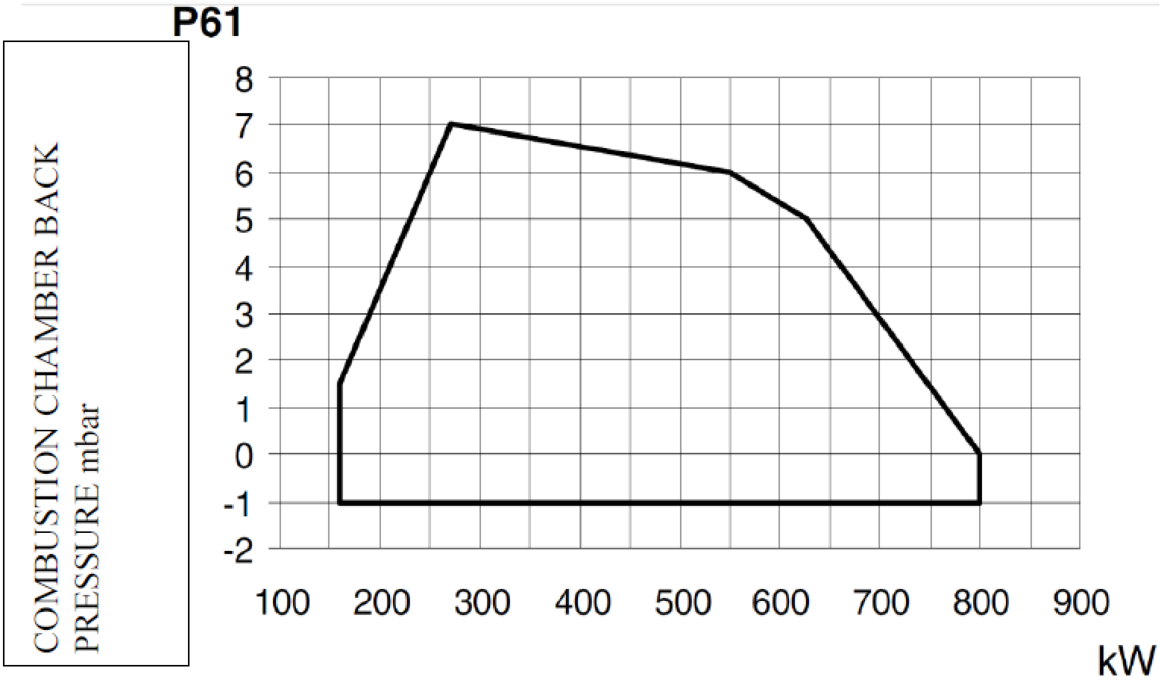


Figure 9 - P61 burner performance curve for LPG fuel

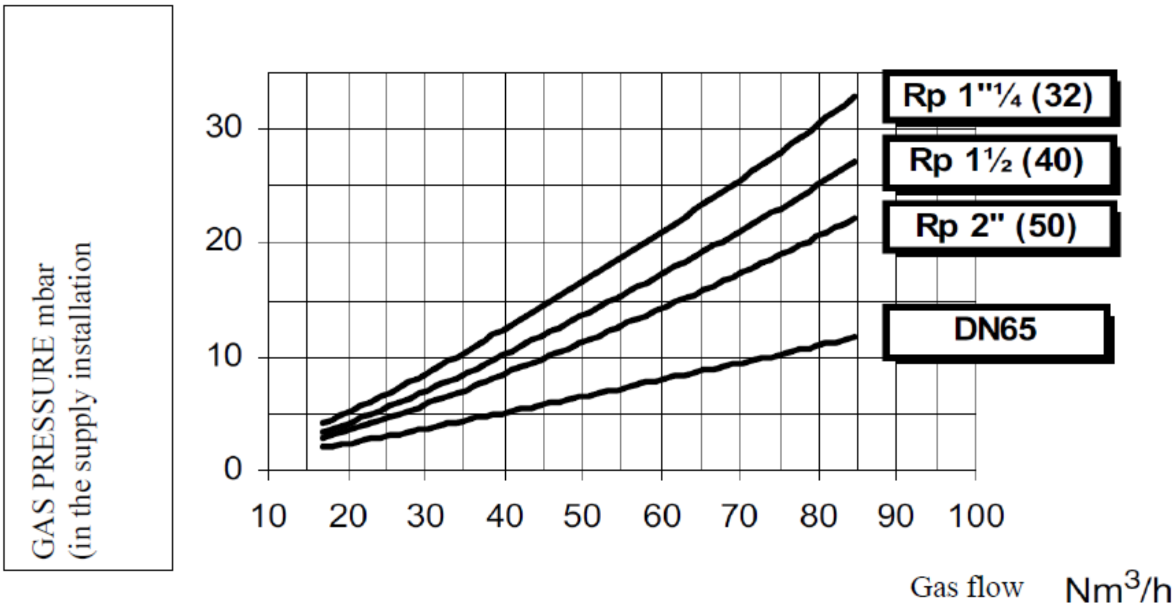


Figure 10 - Installation gas pressure/gas flow curves

The burner operating parameters are continuously monitored by sensors that transmit signals to the process computer software. Any abnormalities in burner operation are immediately signalled visually and acoustically so that early action can be taken."

With regard to the analysis of the pollutant NO_X this is carried out in all chapters and subchapters intended in the EIR.

Some of these are presented below (with the specification that the analysis of the pollutant NO_x resulting from the operation of the analysed incinerator is done in many more places in the EIR but presenting them in the present material would take up too much space. These analyses can be found in the EIR).

Pages 89-94:
Burning fuel (LPG) in the incinerator

Centralised data for pollutants emitted from stationary sources are given in the tables below for an hourly consumption of 122.5 l/incinerator = 122.5 l LPG/h:

Table 28 - LPG emission factors

pollutant emitted	NO_x	PM_{10}	CO
FE mg/mc gas	0.001504	0.0001216	0,00064
FE mg/kg LPG	0.00036	0.000029	0.00015
FE mg/l LPG	0,00065	0.000053	0,00028

Table 29 - Emissions from stationary sources of directed pollution

Source name	Pollutant	Mass flow (mg/h)	Gas/air flow rate (sqm/h)	Emission concentration (mg/sqm)[9]	Alert threshold (mg/sqm)	VLA[10] (mg/sqm)
incinerator exhaust stack	NO_x	0. 08	5000	0.00005	245	350
	SO_2	-		-	24.5	35
	CO	0.006		0.000004	70	100
	PM_{10}	0.034		0.00002	3.5	5
	VOC	-			n.n.	n.n.

Burning of fuel (LPG) and waste in the incinerator

For burning waste in the incinerator, the required hourly fuel consumption was set at 122.5 l LPG/h for an incinerated waste quantity of 300 kg/h.

The emission values given in the technical book for the analysed incinerator are those in Table 15, respectively:

- Solid particle = 1.2 mg/m³
- Sulphur dioxide = 2.4 mg/m³
- Nitrogen Dioxide = 60 mg/m³
- Carbon Monoxide = 78.3 mg/m³
- HCl = 5.38 mg/m³
- HF = 0.04 mg/m³
- TOC = 4.6 mg/m³

These values are valid for an air flow required to burn the fuel used in the incinerator, respectively:

$122.5 \times 25 \times 0.77 = 2415.88 \text{ m}^3$

Taking into account that the IE 1000R-300 incinerator is equipped with an additional injection system (turbine) whose operation is controlled by an automated and computerised temperature and combustion control system and that the injectors are also equipped with turbo blowers which ensure an increased air flow necessary for complete combustion, which are also controlled automatically, an air surplus of between 2000 and 3000 Nm^3 /h is ensured. In this case the average hourly exhaust gas

[9] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process

[10] Reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

flow will be 5000 Nm^3 /h in which case the concentrations of pollutants in the emissions resulting from waste incineration will be corrected by a coefficient of 0.48 (2415.88 m^3 : 5000 m^3 = 0.48**).**

Consequently, the concentrations of these pollutants at the outlet of the incinerator stack will be:

- solid particles = 1.2 x 0.48 = 0.579 mg/m ^{3}
- sulphur dioxide = 2,4 x 0.48 = 1,152 mg/m^3
- nitrogen dioxide = 60 x 0.48 = 28.8 mg/m^3
- carbon monoxide = 78.3 x 0.48 = 37.584 mg/m^3
- HCl = 5.38 x 0.48 = 2.58 mg/m^3
- HF = 0.04 x 0.48 = 0.019 mg/m^3
- TOC = 4.6 x 0.48 = 2.208 mg/m^3

Table 30 - Mass flow rates and concentrations of pollutants emitted to the atmosphere in load operation without additional air supply

Source name	**Pollutant**	**Mass flow (g/h)**	**Gas/air flow rate (m^3 /h)**	**Emission concentration (mg/m)^3[11]**	**VLE[12] (mg/m)^3**	**Outlet point**
LPG combustion + waste	NO_x	144	2416	60	200	incinerator exhaust stack
	SO_2	5.75		2.4	50	
	CO	187.9		78.3	-	
	TSP	2.9		1,2	5	
	VOC	0		0	n.n.	
	HCl	13		5.38	10	
	HF	0.097		0.04	1	
	TOC	11,11		4.6	10	
	PCDD and PCDF	101.47[13]		0.042[14]	0.1[15]	

Table 31 - Mass flow rates and concentrations of pollutants emitted to the atmosphere during load operation with supplementary air supply

Source name	**Pollutant**	**Mass flow (g/h)**	**Gas/air flow rate (m^3 /h)**	**Emission concentration (mg/m)^3[16]**	**VLE[17] (mg/m)^3**	**Outlet point**
LPG combustion + waste	NO_x	144	5000	28.8	200	incinerator exhaust stack
	SO_2	5.75		1.15	50	
	CO	187.9		37,58	-	
	PST	2.9		0.58	5	
	VOC	0		0	n.n.	
	HCl	13		2.6	10	
	HF	0.097		0.019	1	
	TOC	11.11		2.22	10	
	PCDD and PCDF	101.47[18]		0.0035[19]	-	

[11] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process
[12] Daily average limit values acc. Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11%.
[13] expressed in ng I.TEQ/Nmc
[14] ibidem
[15] ibidem
[16] the situation when additional air is added (by forced injection) to the fuel combustion process is considered
[17] Daily average limit values acc. Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11%.
[18] expressed in ng I.TEQ/Nmc
[19] ibidem

Normally the incinerator will only operate with additional air supply because in the event of a fault in this process the automation system will initiate the incinerator shutdown sequence. This consists of:

1. stopping the supply of waste to the primary chamber
2. combustion control in primary chamber injectors with injector air supply
3. operation of the incinerator until all waste in the primary combustion chamber has been incinerated
4. stopping the supply of injectors
5. cooling of incinerator chambers
6. troubleshooting
7. restarting the incinerator

The additional air supply does not affect the amount of pollutant emitted into the atmosphere per unit time but only its concentration at the incinerator stack outlet. This will not affect the calculated values of the pollutant concentrations in the immission determined by mathematical modelling, because the modelling is based on the amounts of pollutants emitted per unit time, regardless of their concentration in the emission.

Table 32 - Pollutants emitted into the atmosphere from incinerator operation

Name of activity	**Sources of air pollutants**					**Physical characteristics of sources**			**Exhaust gas parameters**		
	Name	LPG consumption l/h	Annual working time hours[20]	Pollutants generated	Quantities of pollutants generated kg/year[21]	Name	Height m	Inside diameter (area) at the top of the basket m^2	Speed m/s	temperature °C	Volume flow m^3/s mass flow mg/s
Waste incineration	Incinerator IE 1000R-300	122.5	**10 h/day x 320 days/year = 3200 h/year**	NO_x	0.614	Flue gas exhaust	10	0.5 m 0.196	7.09	1900	• 1.38 • 0.00002
				SO_2	-						• -
				CO	0.046						• 1.38 • 0.0000017
				PM_{10}	0,261						• 1.38 • 0.000009
				VOC	-						• -

[20] Normally in the incinerator, combustion is initiated when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason, it has been calculated that, in practice, the LPG supply to the burners for the operation of the incinerator takes on average 10 hours/day.
[21] the calculation is made for 24 h/day operation (worst case where we have maximum emissions to air), without taking into account the phenomenon of self-combustion of waste

Table 33 - pollutants emitted to the atmosphere from the operation of the incinerator with a waste burning rate of 300 kg/h

Name of activity	**Sources of air pollutants**						**Physical characteristics of sources**			**Exhaust gas parameters**		
	Source name	Amount of waste incinerated kg/h	LPG consumption l/h	Annual working time hours[22]	Pollutants generated	Quantities of pollutants generated kg/year[23]	Name of outlet point	Height m	Inside diameter and area at the top of the basket m/m^2	Speed m/s	temperature °C	Volume flow m^3/s mass flow mg/s
Waste incineration	Incinerator IE 1000R-300	300	122.5	**GPL:** **10 h/day x 320 days/year = 3200 h/year** **waste:** **24 x 320 = 7680 h/year**	NO_x	1105,92	Flue gas exhaust	10	0.5 m 0.785 m^2	1,769	190	• 1.38 • 40
					SO_2	44,16						• 1.38 • 1,6
					CO	1443,07						• 1.38 • 52,19
					PST	22,27						• 1.38 • 0,8
					VOC	-						• 1.38
					HCl	99,58						• 1.38 • 3.61
					HF	0,74						• 1.38 • 0.0269
					TOC	85,10						• 1.38 • 3.086
					PCDD and PCDF	0,000768						• 1.38 • 0.0000278

[22] Normally in the incinerator, combustion is initiated when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason, it has been calculated that, in practice, the LPG supply to the burners for the operation of the incinerator takes on average 10 hours/day.
[23] the calculation is made for 24 h/day operation (worst case where we have maximum emissions to air), without taking into account the phenomenon of self-combustion of **waste**

Pages 98-99:

"Centralised data for pollutants emitted from stationary and mobile sources are given in the tables below:

- stationary sources of directed pollution:

Table 34 - Mass flow rates and concentrations of pollutants emitted to the atmosphere in load operation without additional air supply

Source name	**Pollutant**	**Mass flow (g/h)**	**Gas/air flow rate (m³ /h)**	**Emission concentration (mg/m)[324]**	**VLE[25] (mg/m)[3]**	**Outlet point**
LPG combustion + waste	NO_x	144	2416	60	200	incinerator exhaust stack
	SO_2	5.75		2.4	50	
	CO	187.9		78.3	-	
	PST	2.9		1.2	5	
	VOC	0		0	n.n.	
	HCl	13		5.38	10	
	HF	0.097		0.04	1	
	TOC	11.11		4.6	10	

Table 35 - Mass flow rates and concentrations of pollutants emitted to the atmosphere during load operation with supplementary air supply

Source name	Pollutant	Mass flow (g/h)	Gas/air flow rate (m³ /h)	Emission concentration (mg/m)[326]	VLA[27] (mg/m)[3]	Outlet point
LPG combustion + waste	NO_x	144	5000	28,8	200	incinerator exhaust stack
	SO_2	5.75		1,15	50	
	CO	187.9		37,58	-	
	PST	2.9		0,58	5	
	VOC	0		0	n.n.	
	HCl	13		2,6	10	
	HF	0.097		0,019	1	
	TOC	11.11		2,22	10	

Table 36 - Pollutant mass flow rates - stationary directed pollution sources

Source name	Pollutant	Mass flow (mg/h)	Gas/air flow rate (m³ /h)	Emission concentration (mg/m)[328]	Alert threshold (mg/m)[3]	VLA[29] (mg/m)[3]
incinerator exhaust stack	NOx	0.08	5000	0.00005	245	350
	SO2	-		-	24.5	35
	CO	0.006		0,000004	70	100
	PM10	0.034		0.00002	3.5	5
	VOC	-			n.n.	n.n.

[24] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process

[25] Daily average limit values cf Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

[26] the situation where additional air is added (by forced injection) to the fuel combustion process is considered

[27] Daily average limit values cf Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

[28] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process

[29] Reference conditions T = 273 oK, P = 101,3 kPa, dry gas, oxygen content 11 %.

Page 114:

The maximum emission concentrations from the incinerator in relation to the regulated limits are shown in the following table:

Table 37 - Maximum emission concentrations from the incinerator in relation to regulated limits

Source	Pollutant	Mass flow g/h	Emission competition with additional air supply mg/Nmc	Conc. to emission without additional air supply mg/Nmc	VLE cf. Annex 6, L 278/2013 mg/Nmc
IE 1000R-300 incinerator flue gas exhaust stack	NO_X	144	28.8	60	200
	SO_2	5.75	1.15	2.4	50
	CO	187.9	37.58	78.3	-
	Particles	2.9	0.58	1.2	5
	HCl	0	2.6	5.38	10
	HF	13	0.019	0.04	1
	TOC	0.097	2.22	4.6	10

The concentrations of pollutants emitted by the incinerator are within the maximum permissible limits (MRLs) according to Annex 6, L 278/2013 for all indicators.

The mass flow rates of pollutants discharged into the atmosphere, calculated at maximum operating speed, are relatively low."

etc........

3. Emission standards are not expected to be breached. The information describes that the burners will only be used for 10 hours per day, during which time low NOx emissions are expected. It is omitted to take into account that NOx is also formed from the burning of waste during the use of the burners and in the self-combustion processes. The Waste Incineration Directive introduces a limit of 200 mg/m3 for NOx emissions. It should therefore be specified which combustion process controls should be applied to keep the incineration plant within the ELV limit, as no NOx treatment plant is foreseen.

Answer:

In the scientific analysis carried out in several chapters and subchapters of the EIR it was specified that the 10 hours/day reporting was used only for the calculation of the amount of fuel consumed per day, not for the calculation of pollutant emissions, respectively:

- page 41: "Normally in the incinerator, combustion (with LPG) is initiated when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason, it has been calculated that, in practice, for the operation of the incinerator for a period of 24 hours/day the LPG supply to the burners is on average only 10 hours/day".
- page 93: calculation of pollutant quantities for 24 h/day operation of the incinerator (including NOx)
- complex calculations and assessment methods for the pollutant NOx as well as its impact on air quality have been carried out and presented on pages 99- 100, 124-129, 169, 177 - 179

Pages 98-101:

"Table 38 - Mass flow rates and concentrations of pollutants emitted to the atmosphere at load operation without additional air supply

Source name	**Pollutant**	**Mass flow (g/h)**	**Gas/air flow rate (m^3 /h)**	**Emission concentration (mg/m)[3][30]**	**VLE[31] (mg/m)[3]**	**Outlet point**
LPG combustion + waste	NO_x	144	2416	60	200	incinerator exhaust stack
	SO_2	5.75		2.4	50	
	CO	187.9		78.3	-	
	PST	2.9		1.2	5	
	VOC	0		0	n.n.	
	HCl	13		5.38	10	
	HF	0.097		0.04	1	
	TOC	11.11		4.6	10	

Table 39 - Mass flow rates and concentrations of pollutants emitted to the atmosphere during load operation with supplementary air supply

Source name	Pollutant	Mass flow (g/h)	Gas/air flow rate (m^3 /h)	Emission concentration (mg/m)[3][32]	VLA[33] (mg/m)[3]	Outlet point
LPG combustion + waste	NO_x	144	5000	28.8	200	incinerator exhaust stack
	SO_2	5.75		1.15	50	
	CO	187.9		37.58	-	
	PST	2.9		0.58	5	
	VOC	0		0	n.n.	
	HCl	13		2.6	10	
	HF	0.097		0.019	1	
	TOC	11.11		2.22	10	

Table 40 - Pollutant mass flow rates - stationary directed pollution sources

Source name	Pollutant	Mass flow (mg/h)	Gas/air flow rate (m^3 /h)	Emission concentration (mg/m)[3][34]	Alert threshold (mg/m)[3]	VLA[35] (mg/m)[3]
incinerator exhaust stack	NOx	0.08	5000	0.00005	245	350
	SO2	-		-	24.5	35
	CO	0.006		0.000004	70	100
	PM10	0.034		0.00002	3.5	5
	VOC	-			n.n.	n.n.

Table 41 - Pollutant mass flows - mobile pollution sources

Source		Mass flow (g/h)						
		NO_x	CH_4	VOC	CO	$N\ O_2$	CO_2	SO_2
	FE g/kg fuel	15.9	0.055	4.64	1.58	0.188	3138	2
	hourly diesel consumption l/h - kg/h							
special car	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

[30] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process

[31] Daily average limit values cf Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

[32] the situation when additional air is added (by forced injection) to the fuel combustion process is considered

[33] Daily average limit values cf Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

[34] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process

[35] Reference conditions T = 273 oK, P = 101,3 kPa, dry gas, oxygen content 11 %.

Pollution indices for pollutant emissions - incinerator.
Ip NOx = (0.08 mg/mc : 350 mg/mc) x 100 = 2.28 %.
Ip CO = (0.006 mg/mc : 100 mg/mc) x 100 = 0.006 %.
Ip particulates = (0.034 mg/mc : 5 mg/mc) x 100 = 3.52
Ip HCl = (5.38 mg/mc : 10 mg/mc) x 100 = 53.8
Ip HF = (0.04 mg/mc : 1 mg/mc) x 100 = 4 %.
Ip TOC = (4.6 mg/mc : 10 mg/mc) x 100 = 46 % = 46

Pollution indices for pollutant emissions - incinerator with additional air supply.
Ip NO_x = (28.8 mg/mc : 200 mg/mc) x 100 = 14.4
Ip SO_2 = (1.15 mg/mc : 50 mg/mc) x 100 = 2.3
Ip particulates = (0.58 mg/mc : 5 mg/mc) x 100 = 11.6
Ip HCl = (2.6 mg/mc : 10 mg/mc) x 100 = 26
Ip HF = (0.019 mg/mc : 1 mg/mc) x 100 = 1.9
Ip TOC = (2.22 mg/mc : 10 mg/mc) x 100 = 22.2

Emission credit notes - incinerator

Table 42 - Emission credit ratings - incinerator without additional air supply

Indicator	Ip value	Note Nb
NO_x	30 %	8
SO_2	4.8 %	9
Powders in suspension.	24 %	8
HCl	53.8 %	8
HF	4 %	9
TOC	46 %	8

Nbincinerator[1] = 8.33

Table 43 - Emission credit ratings - incinerator with supplementary air supply

Indicator	Ip value	Note Nb
NO_x	14.4 %	9
SO_2	2.3 %	9
Powders in suspension.	11.6 %	9
HCl	26 %	8
HF	1.9 %	9
TOC	22.2 %	8

Nbincinerator[2] = 8.66

Pollution indices for pollutant emissions - incinerator[36]
Ip NO_x = (0.8 µg/mc : 200 µg/mc) x 100 = 0.4
Ip CO = (0.4 µg/mc : 10000 µg/mc) x 100 = 0.004 %
Ip PM = (0.02 µg/mc : 50 µg/mc) x 100 = 0.04 %.
Ip SO_2 = (0.04 µg/mc : 350 µg/mc) x 100 = 0.011 %

Credit notes granted for imis - incinerator

Table 44 - Credit ratings for imis - incinerator

Indicator	Ip value	Note Nb
NO_x	0.4 %	9
CO	0.004 %	9
Powders in suspension.	0.04 %	9
SO_2	0.011 %	9

[36] the values determined at the nearest dwelling boundary shall be used

Nbincinerator = 9

<u>The credit ratings for imissions at the border with with Bulgaria</u>[37]

Ip NO_x = (0.4 µg/mc : 200 µg/mc) x 100 = 0.2 %.

Ip CO = (0.1 µg/mc : 10000 µg/mc) x 100 = 0.001 %

Ip PM = (0.01 µg/mc : 50 µg/mc) x 100 = 0.02 %.

Ip SO_2 = (0.02 µg/mc : 350 µg/mc) x 100 = 0.0057 %

Indicator	Ip value	Note Nb
NO_x	0.2 %	9
CO	0.001 %	9
Powders in suspension.	0.02 %	9
SO_2	0,0057 %	9

$Nb_{\text{border imissions}}$ = 9

<u>Credit ratings for the environmental factor air</u>

Table 45 - Credit ratings for the environmental factor air without additional air input to the incinerator combustion system

Indicator	Note Nb
Emissions	8.33
Immissions	9

Nbaer1 = 8.67

Table 46 - Credit ratings for the environmental factor air with additional air input to the incinerator combustion system

Indicator	Note Nb
Emissions	8.66
Imisii	9

Nbaer2 = 8.83

The air environment factor will be affected by the project within allowable limits with no quantifiable effects."

4. The pollutant hydrogen chloride: The most significant acid gas in terms of difficulty of control within the permissible limits is hydrogen chloride (HCl). The half-hourly average for HCl is 60 mg/m3,- therefore, peaks or spikes of HCl for short periods of time that significantly exceed this level may result in a violation of the ELV. High HCl peaks are common in municipal solid waste incinerators, hospital waste incinerators and hazardous waste incinerators. The best available techniques currently used to minimise reagent use are to inject a variable amount of alkaline reagent in response to changing HCl concentration in the flue gas. However, to be effective, the reaction time must be almost instantaneous. Practice has shown that this proves extremely difficult because the sampling time is too long to update the amount of reagent quickly enough. For this reason, commonly used dry and semi-dry acid gas abatement systems must be continuously overdosed with an alkaline reagent to compensate for occasional peak levels of HCl from high chlorine waste (e.g. plastics). In connection with the above, it is also necessary to consider an alternative treatment method used to demonstrate compliance with established HCl standards, even at peak emissions.

[37] the values at the border with Bulgaria obtained by mathematical modelling are used

Answer:

It has been demonstrated in the EIR, both by calculation and by mathematical modelling, that the plant to be used and which will be equipped and will use the latest methodologies meets all the safety standards for all the pollutants emitted and that the values of the concentrations of the pollutants emitted will be well below the emission limit values or below the maximum permissible values laid down in the legislation in force, both in terms of emission and emission.

According to Table 66 on page 172 of the EIR where the maximum concentration values in immission for HCl for the 30-minute measurement period <u>are 0.1 µg/mc</u>, which is 6 x 10^5 lower than the value of 60 mg/mc

Table 47 - Variation of HCl concentration with distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)			(µg/mc)			
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
400		0.1											
1500		0.08											
3010		0.05											
Bulgaria		0.03											
Ruse		0.03											
4915		0.03											
10000		0.01											
15000		0.003											
	775		0.01										
	1180		0.008										
	1760		0.005										
	Bulgaria		0.003										
	Ruse		0.003										
	3640		0.003										
	7370		0.001										
	10000		0.0005										
	15000		0.0003										

5. In the Environmental Impact Assessment Report, Table 59 and Table 60 indicate a flue gas outlet temperature of 190°C. According to the technical characteristics and principle of action, sodium bicarbonate is most effective in removing acid gases at high temperatures of about 160°C. However, at such high temperatures, activated carbon (injected to remove mercury and dioxins) becomes less effective. In connection with the above, a careful and critical analysis of the injection devices and the relevant temperature at which the dust extraction is subsequently carried out is necessary, as this is where most of the reaction between the acid gases and the injected reagent takes place.

Answer:

The efficiency of the dry-cleaning system to be used has been demonstrated by the manufacturer at the time of approval of this installation, at the working parameters presented. This efficiency overlaps and is complemented by the performance of the incineration equipment which ensures that the incineration plant operates within the legal limits for both emission and immission pollutant concentrations. has demonstrated this for each pollutant in the analysis and evaluations carried out in the EIR using approved scientific methods.

6.The short distance from the proposed incinerator site to the town of Ruse (less than 4 km), as well as the prevailing wind direction - north/north-east (23.4% of the year), is a serious prerequisite for the occurrence of problems related to emissions of strong-smelling substances from the processes of non-hazardous, medical (non-hazardous and hazardous) and animal waste disposal.

Answer:

It was highlighted in the EIR that this phenomenon will not occur (see pages 29, 46, 183, 214, 243 where odour was dealt with):

"the operator of the waste incineration plant is obliged to comply with internal procedures regarding the necessary precautionary measures for the delivery and reception of waste in order to prevent or limit, as far as possible, pollution of air, soil, surface water, groundwater and other negative effects on the environment, i.e. odours, noise and direct risks to human health".

"The treatment plant with a capacity of 417 l/h, type CN 2C is designed by DAIKI company from Japan and assembled by S.C. ASTEC ROMANIA S.R.L. The plant operates buried up to the manholes, in the vicinity of the sewage network capable of taking the flow of treated water, being designed for protection against very low temperatures but also against the emanation of unpleasant odors."

"With regard to a possible impact on the environment and on the population in the area caused by the possible presence of odours resulting from the incineration activity analysed, we make the following clarifications:

1. if all internal procedures related to the reception, temporary storage, handling and incineration of the waste analysed are followed, then no odours will be generated which would have a significant negative impact on the population
2. if animal waste is to be handled, the rules on its transport from the generator to the incinerator site shall be strictly observed and a cold room shall be used for its temporary storage until it is incinerated - in which case no odours shall be generated that would have a significant negative impact on the population".

"- for incineration plants, an accident management plan. The company will implement the necessary management techniques, i.e. draw up:

- Odour management plan
- Noise management plan
- Accident management plan

- for hearth ash treatment plants, management of diffuse dust emissions (see BAT 23) - not applicable

- an odour management plan if odour pollution is expected and/or proven to exist in sensitive areas (see section 2.4) - although this would not be the case because the site is in an area declared by the Giurgiu Local Council as an industrial area and the activity itself will not generate excessive odours the company will draw up such a plan."

	Technique	Description	Applicability
a)	Mixing and blending of waste	Procedures for mixing and blending waste prior to incineration include, for example, the following operations: • mixing with hopper cranes - not applicable • use of a power equalisation system - not applicable • mixing of compatible liquid and paste waste. In some cases, solid waste is shredded before mixing - a criterion that will only be met when appropriate	It will not apply if the furnace must be directly fed for safety reasons or because of the characteristics of the waste (e.g. infectious medical waste, smelly waste or waste that is likely to release volatile substances). It will not apply in situations where undesirable reactions may occur between different types of waste (see BAT 9 f).
b)	Advanced control system	The use of a computerised automatic control system to control combustion efficiency and support emission prevention and/or reduction. The use of high-performance monitoring of operating	Generally applicable The IR 1000-300 incinerator and the continuous monitoring system of the operating and combustion parameters with which it will be

		parameters and emissions is also included - full criterion met	equipped fully meets this requirement.
c)	Optimising the incineration process	Optimization of waste feed rate, waste composition, temperature, and primary and secondary combustion air flow rates and injection points to effectively oxidize organic compounds while reducing NO_X - criterion fully met by the IR 1000-300 incinerator	Design optimisation will not apply to existing furnaces

The company complies with and will apply the provisions of the BATs for:

a) diffuse emissions

1. BAT 21. To prevent or reduce diffuse emissions from the incineration plant, including odour emissions, BAT consists of:

a) store solid waste and bulk waste in bulk that is odorous and/or likely to release volatile substances in enclosed buildings under controlled subatmospheric pressure and use the extracted air as combustion air for incineration or send it to another appropriate abatement system in case of an explosion hazard - not applicable

b) store liquid waste in tanks under appropriate controlled pressure and direct tank vents to the combustion air supply system or other suitable abatement system - not applicable

c) control the risk of odour release during complete shutdown periods when no incineration capacity is available, e.g. by:
   - sending the exhausted or extracted air to an alternative abatement system, e.g. wet cleaning, fixed adsorption bed - criterion met. The IE 1000R-300 incinerator is equipped with a dry gas scrubbing system
   - minimising the amount of waste landfilled, e.g. by stopping, reducing or transferring waste deliveries, as part of waste stream management (see BAT 9) - to be applied after obtaining the AM (environmental permit)
   - the storage of waste in properly sealed bales - a criterion to be met only where appropriate

2. BAT 22. In order to prevent diffuse emissions of volatile compounds caused by the handling of gaseous and liquid wastes that are odorous and/or likely to release volatile substances in incineration plants, BAT consists of direct feeding into the furnace. For gaseous and liquid wastes delivered in waste containers suitable for incineration (e.g. drums), direct feeding is achieved by placing the containers directly into the furnace - criterion to be met
   They may not be applicable to sewage sludge incineration, depending for example on the water content and the need for pre-drying or mixing with other wastes.

Technique	Description	Applicability to S.C. Friendly Waste Romania S.R.L.
Odour management plan	The odour management plan is part of the environmental management system (see BAT 1) and includes: (a) a protocol for conducting odour monitoring in accordance with EN standards (e.g. dynamic olfactometry in accordance with EN 13725 to determine odour concentration); this may be supplemented by measurement/estimation of odour exposure (e.g. in accordance with EN 16841-1 or EN 16841-2) or by estimation of odour impact; (b) a protocol for responding to identified incidents involving the release of odours, e.g. complaints; (c) an odour prevention and abatement programme designed to identify the source(s) of odours, characterise source contributions and implement prevention and/or abatement measures	To be applied in the operational phase. after obtaining the AM (environmental permit)

"Through the measures to protect the environmental factors mentioned in this study and in the study of the impact assessment on the health of the population, will result in emissions below the emission limit values, odours perceived strictly in the area of the incinerator site, the perimeter curtain of the site will be made of trees and shrubs. The investment will not cause discomfort to the inhabitants of Drumul Cătunului Street.

Access to the objective, both during implementation and operation, will be from Slobozia Road, without affecting the population in the eastern part of the site through traffic noise and emissions of particulate matter and exhaust gases.

If animal waste is to be handled, the rules for transporting it from the generator to the incinerator must be strictly observed and a cold room must be used for temporary storage until it is incinerated, to avoid generating odours that could have a negative impact on the population."

7. In order to take into account the most significant contribution of the installation to the ambient air quality in the territory of the Republic of Bulgaria and in particular in the city of Ruse, a mathematical modelling of the dispersion and the expected concentrations of pollutants in the ground layer of the atmosphere shall be carried out, using as input data a mass flow calculated on the basis of the pollutant emission limits set for the installation and the maximum permissible flow rate. The results (concentrations) of this modelling should ensure that at these and lower stack emission levels, emissions of harmful substances will not lead to exceedances of the standards established for the protection of human health. In this case, pollutant concentrations based on emission factors and data from the incinerator's passport (technical book) were used to calculate the mass flow rate, which is a prerequisite for possible underestimation of the air quality impact of the plant when operating at higher but compliant emission levels.

Answer:
Throughout the analysis in the EIR it was specified that all calculations and modelling were carried out for worst-case scenarios (even if these can only be encountered theoretically) which include the plant operating at full capacity (see pages 87, 90, 92, 93, 98).

Page 86:
"Characterisation of air pollutant sources related to the objective

The incinerator to be located on the site

The IE 1000R-300 incinerator is to be installed on the site under consideration.

It runs on LPG and will have an hourly consumption of approx. 122 l/h resulting in a flue gas volume of 583.4 m^3 /h plus the air introduced by the forced draught supply system resulting in a flue gas volume of 5000 m /h.^{3}

The source falls into the category of sources with controlled pollutant control facilities (emission containment) and is equipped with a dry absorbing system.

For the determination of the exhaust gas flow rate to the incinerator stack the calculation is exemplified below:

Stoichiometric conditions in the combustion process refer to the quantitative ratios between the fuel constituents and air.

Under laboratory conditions, with accurate and controlled measurements, one can speak of stoichiometric conditions, with an exact calculation of masses in the ratio of elements. Under normal operating conditions, this is impossible.

The energy source in any fuel is carbon. In fuels there are also other elements that influence combustion, namely N, S, H_2 0.

For different types of fuel there is a ratio between the amount of atmospheric air (20% O_2) consumed to burn one kg of fuel.

The ratio for LPG is 1 l LPG requires 25 l air.

The calorific value for one litre of LPG is 11070 kcal/kg

1 kg LPG = 1.727 litres

1 kg air = 0.77 m^3

One kg of LPG requires 14.475 Nm^3 of air and one litre of LPG approximately 0.025 Nm^3 of air.

These are theoretical stoichiometric conditions.

In practice the conversion phenomenon is not 100% efficient, so burner manufacturers offer the possibility of adding excess air. In most cases this is up to 100%.

Taking all these data into account, the flue gas flow rates (where the additional air supply providing the necessary oxygen for combustion is also taken into account) can be calculated for the incinerator analysed above (all calculations are expressed under normal pressure and temperature conditions - 273.15° K, 101.325 kPa):

IER incinerator - 1000-300

122.5 x 25 x 0.77 + 100 % = 4716.25 Nm^3 /h

The literature says that an incinerator should provide at least 6% excess oxygen.

It follows from the above that for every Kilocalorie we have to provide

9,542 / 8520 = 0.0011971 m^3 of air.

The incinerator is equipped to provide additional air for combustion, depending on the capacity of the primary combustion chamber. Thus, we have the situations:

- The IE 1000R-300 incinerator is equipped with an additional air injection system (turbine) whose operation is controlled by the automated and computerised temperature and combustion control system;
- At the same time, the injectors are also equipped with turbo blowers that ensure an increased air flow necessary for complete combustion, which are also controlled automatically. This system provides an air surplus of between 2000 and 3000 Nm^3 /h. In this case the average hourly exhaust flow will be 5000 Nm^3 /h."

Pages 89-94:

Burning fuel (LPG) in the incinerator

Centralised data for pollutants emitted from stationary sources are given in the tables below for an hourly consumption of 122.5 l/incinerator = 122.5 l LPG/h:

Table 48 - LPG emission factors

pollutant emitted	NO_X	PM_{10}	CO
FE mg/mc gas	0.001504	0.0001216	0,00064
FE mg/kg LPG	0.00036	0.000029	0.00015
FE mg/l LPG	0,00065	0.000053	0,00028

Table 49 - Emissions from stationary sources of directed pollution

Source name	Pollutant	Mass flow (mg/h)	Gas/air flow rate (m^3/h)	Emission concentration (mg/m^3)[38]	Alert threshold (mg/m^3)	VLA[39] (mg/m^3)
incinerator exhaust stack	NO_x	0.08	5000	0.00005	245	350
	SO_2	-		-	24.5	35
	CO	0,006		0,000004	70	100
	PM_{10}	0.034		0.00002	3.5	5
	VOC	-			n.n.	n.n.

Burning of fuel (LPG) and waste in the incinerator

For burning waste in the incinerator, the required hourly fuel consumption was set at 122.5 l LPG/h for an incinerated waste quantity of 300 kg/h.

The emission values given in the technical book for the analysed incinerator are those in Table 15, respectively:

- Solid particle = 1.2 mg/m^3
- Sulphur dioxide = 2.4 mg/m^3
- Nitrogen Dioxide = 60 mg/m^3
- Carbon Monoxide = 78.3 mg/m^3
- HCl = 5.38 mg/m^3
- HF = 0.04 mg/m^3
- TOC = 4.6 mg/m^3

These values are valid for an air flow required to burn the fuel used in the incinerator, respectively:

122.5 x 25 x 0.77 = 2415.88 m3

Taking into account that the IE 1000R-300 incinerator is equipped with an additional injection system (turbine) whose operation is controlled by an automated and computerized temperature and combustion control system and that the injectors are also equipped with turbo blowers which ensure an increased air flow necessary for a complete combustion which is also controlled automatically, a surplus of air between 2000 and 3000 Nm3/h is ensured. In this case the average hourly exhaust gas flow will be 5000 Nm3/h, in which case the concentrations of pollutants in the emissions resulting from the incineration of waste will be corrected by a coefficient of 0.48 (2415.88 m3 : 5000 m3 = 0.48).

Consequently, the concentrations of these pollutants at the outlet of the incinerator stack will be:

- solid particles = 1.2 x 0.48 = 0.579 mg/m^3
- sulphur dioxide = 2.4 x 0.48 = 1.152 mg/m^3
- nitrogen dioxide = 60 x 0.48 = 28.8 mg/m^3

[38] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process
[39] Reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11 %.

- carbon monoxide = 78.3 x 0.48 = 37.584 mg/m^3
- HCl = 5.38 x 0.48 = 2.58 mg/m^3
- HF = 0.04 x 0.48 = 0.019 mg/m^3
- TOC = 4.6 x 0.48 = 2.208 mg/m^3

Table 50 - Mass flow rates and concentrations of pollutants emitted to the atmosphere in load operation without additional air supply

Source name	Pollutant	Mass flow (g/h)	Gas/air flow rate (m3/h)	Emission concentration (mg/m3)40	VLE41 (mg/m3)	Outlet point
LPG combustion + waste	NOx	144	2416	60	200	incinerator exhaust stack
	SO2	5.75		2.4	50	
	CO	187.9		78.3	-	
	TSP	2.9		1,2	5	
	VOC	0		0	n.n.	
	HCl	13		5.38	10	
	HF	0.097		0.04	1	
	TOC	11.11		4.6	10	
	PCDD and PCDF	101.47[42]		0.042	0,143[44]	

Table 51 - Mass flow rates and concentrations of pollutants emitted to the atmosphere during load operation with supplementary air supply

Source name	**Pollutant**	**Mass flow (g/h)**	**Gas/air flow rate (m^3 /h)**	**Emission concentration (mg/m)[345]**	**VLE[46] (mg/m)[3]**	**Outlet point**
LPG combustion + waste	NO_x	144	5000	28.8	200	incinerator exhaust stack
	SO_2	5.75		1.15	50	
	CO	187.9		37,58	-	
	PST	2.9		0.58	5	
	VOC	0		0	n.n.	
	HCl	13		2.6	10	
	HF	0.097		0.019	1	
	TOC	11.11		2.22	10	
	PCDD and PCDF	101.47[47]		0.0035[48]	-	

The additional air supply does not affect the amount of pollutant emitted into the atmosphere per unit time but only its concentration at the incinerator stack outlet. This will not affect the calculated values of the pollutant concentrations in the immission determined by mathematical modelling, because the modelling is based on the amounts of pollutants emitted per unit time, regardless of their concentration in the emission.

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[40] the worst-case situation is considered when no additional air is added (by forced injection) to the fuel combustion process
[41] Daily average limit values acc. Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11%.
[42] Expressed in ng.ITEQ/Nmc
[43] ibidem
[44] ibidem
[45] the situation when additional air is added (by forced injection) to the fuel combustion process is considered
[46] Daily average limit values acc. Annex 6, L 278/2013, reference conditions T = 273° K, P = 101,3 kPa, dry gas, oxygen content 11%.
[47] expressed in ng I.TEQ/Nmc
[48] ibidem

Table 52 - Pollutants emitted to the atmosphere from incinerator operation

<table>
<tr><th rowspan="2">Name of activity</th><th colspan="5">Sources of air pollutants</th><th colspan="3">Physical characteristics of sources</th><th colspan="3">Exhaust gas parameters</th></tr>
<tr><th>Name</th><th>LPG consumption
l/h</th><th>Annual working time
hours[49]</th><th>Pollutants generated</th><th>Quantities of pollutants generated
kg/year[50]</th><th>Name</th><th>Height
m</th><th>Inside diameter (area) at the top of the basket
m^2</th><th>Speed
m/s</th><th>temperature
ºC</th><th>Volume flow
m^3 /s
mass flow
mg/s</th></tr>
<tr><td rowspan="5">Waste incineration</td><td rowspan="5">Incinerator IE 1000R-300</td><td rowspan="5">122.5</td><td rowspan="5">10 h/day x 320 days/year = 3200 h/year</td><td>NO_x</td><td>0/614</td><td rowspan="5">Flue gas exhaust</td><td rowspan="5">10</td><td rowspan="5">0.5 m
0.196</td><td rowspan="5">7.09</td><td rowspan="5">1900</td><td>• 1.38
• 0.00002</td></tr>
<tr><td>SO_2</td><td>-</td><td>• -</td></tr>
<tr><td>CO</td><td>0.046</td><td>• 1.38
• 0.0000017</td></tr>
<tr><td>PM_{10}</td><td>0.261</td><td>• 1.38
• 0.000009</td></tr>
<tr><td>VOC</td><td>-</td><td>• -</td></tr>
</table>

[49] Normally in the incinerator, combustion is initiated when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason, it has been calculated that, in practice, for the operation of the incinerator, the LPG supply to the burners is carried out on average 10 hours/day.
[50] the calculation is made for 24 h/day operation (worst case where we have maximum emissions to air), without taking into account the phenomenon of self-combustion of waste

Table 53 - pollutants emitted to the atmosphere from the operation of the incinerator with a waste burning rate of 300 kg/h

Name of activity	**Sources of air pollutants**						**Physical characteristics of sources**			**Exhaust gas parameters**		
	Source name	Amount of waste incinerated kg/h	LPG consumption l/h	Annual working time hours[51]	Pollutants generated	Quantities of pollutants generated kg/year[52]	Name of outlet point	Height m	Inside diameter and area at the top of the basket m/m^2	Speed m/s	temperature °C	Volume flow m^3/s mass flow mg/s
Waste incineration	Incinerator IE 1000R-300	300	122.5	**GPL:** **10 h/day x 320 days/year = 3200 h/year** **waste:** **24 x 320 = 7680 h/year**	NO_x	1105.92	Flue gas exhaust	10	0.5 m 0.785 m^2	1.769	190	• 1.38 • 40
					SO_2	44.16						• 1.38 • 1.6
					CO	1443.07						• 1.38 • 52.19
					PST	22.27						• 1.38 • 0.8
					VOC	-						• 1.38
					HCl	99.58						• 1.38 • 3.61
					HF	0.74						• 1.38 • 0.0269
					TOC	85.10						• 1.38 • 3.086
					PCDD and PCDF	0.000768						• 1.38 • 0.0000278

[51] Normally in the incinerator, combustion is initiated when the waste is fed into the incinerator and then the combustion is maintained by the heat input (self-sustaining combustion) from the incinerated waste. For this reason, it has been calculated that, in practice, for the operation of the incinerator, the LPG supply to the burners is carried out on average 10 hours/day.
[52] the calculation is made for 24 h/day operation (worst case where we have maximum emissions to air), without taking into account the phenomenon of self-combustion of waste

8. There are no methodologies used to assess environmental noise emissions and there is no information on how environmental noise emissions are controlled during normal operation of the installation.

Answer:

In order to analyse the impact of the noise level generated by the operation of an installation, we consider :

- the starting point is the noise level generated by an installation during its operation, i.e. these values are taken from technical books
- apply the specific equations and determine the noise level at a certain distance from the emission source
- the installation analysed generates noise during operation at a maximum value of 60 dB(A)
- at a distance of 3317 m (the distance to the border between Romania and the Republic of Bulgaria), even in the open, the value for which the recorded A-weighted equivalent continuous sound pressure level will be negligible

III. Regarding the impact of the proposed investment (IP) on people and the possible health risk of its implementation:

1.The updated report confirms the information that the incinerator will not only accept hospital waste, as stated in its name (IP), but will also accept animal waste, food industry waste and other waste.

Answer:

Throughout the EIR, both the operation of the incinerator and the impact of its operation on all environmental factors were analysed for the situation where all waste categories presented in the EIR would be processed.

2. The presented modelling of air emissions does not take into account the fact that the IP will handle an incinerated waste of varying origin and composition, which is likely to significantly affect the qualitative composition of the emissions. In the mathematical modelling of emissions it is not clear what type of waste or mixture of waste is incinerated.

Answer:

1. incinerated waste will not be handled
2. both mathematical calculations and modelling to determine the dispersion of each air pollutant have been carried out for all types of waste to be incinerated

3. No modelling is presented for the spread of emissions under cumulative effect conditions with other organised emission sources. The IP is located in an industrial area and is likely to have a cumulative emission effect with other companies in the industrial area of Giurgiu and in the industrial areas of Ruse.

Answer:

According to the results of the mathematical modelling the concentrations in immission of all types of pollutants generated from the operation of the plant, the values determined for all averaging periods (including those determining the concentrations of pollutants with the greatest effect on the health of the population) are at values well below the maximum permissible values (see tables on pages 169÷176). These values of concentrations in immission are so low that they will not be able to generate a cumulative effect with any other emission source if it is operating within the legal parameters.

There are no other sources of emissions in the area of the installation at values that generate a cumulative effect that would lead to exceeding the limit values in the immission for pollutants generated from the operation of the installation .

"Centralization of data obtained from mathematical modeling of pollutant dispersion in the atmosphere:

CARBON MONOXIDE (CO)

Table 54 - Variation of CO concentration with distance from the emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Ecosystem			Obs.
						Hourly value (µg/mc)			Daily value (µg/mc)						
8 h	24 h	1 year	8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
900			0.4						10000	7000	5000				< VL
2900			0.2												< VL
Bulgaria[53]			0.1												< VL
Ruse[54]			0.1												
4000			0.1												< VL
5300			0.08												< VL
6700			0.06												< VL
10000			0.02												< VL
15000			0.008												< VL
	1380			0.1											< VL
	1660			0.08											< VL
	3340			0.05											< VL
	Bulgaria			**0.03**											< VL
	Ruse			0.03											
	5080			0.03											< VL
	10000			0.01											< VL
	15000			0.05											< VL
		760			0.02										< VL
		1290			0.01										< VL
		1500			0.006										< VL
		1900			0.004										< VL
		Bulgaria			**0.001**										< VL
		Ruse			**0.001**										
		5000			0.001										< VL
		10000			-										< VL
		15000			-										< VL

53 at the border with Bulgaria at a distance of 3317 m

54 at the border of the residential area of Ruse at a distance of 3856 m

NO_x

Table 55 - Variation of NOx concentration with distance from the emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value (µg/mc)			Annual value (µg/mc)						
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
400			1			200	140	100	40	32	26	30	24	19,5	< VL
1900			0.8												< VL
3390			0.5												< VL
Bulgaria			**0.4**												< VL
Ruse			0.4												
5330			0.3												< VL
355			5												< VL
10000			0.1												< VL
15000			0.05												< VL
	890			0,1											< VL
	1450			0.08											< VL
	2800			0.05											< VL
	Bulgaria			**0.03**											< VL
	Ruse			0.03											
	3680			0.03											< VL
	8000			0.01											< VL
	10000			0.005											< VL
	15000			0.003											< VL
		960			0.01										< VL
		1400			0.007										< VL
		1700			0.005										< VL
		2200			0.003										< VL
		Bulgaria			**0.001**										< VL
		Ruse			0.001										
		3880			0.001										< VL
		7900			0.00032										< VL
		10000			-										< VL
		15000			-										< VL

SO_x

Table 56 - Variation of SO_2 concentration with distance from emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value (µg/mc)			Daily value (µg/mc)			Annual value (µg/mc)			
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
540			0.04			350			125	75	50	20	12	8	< VL
3280			0.02												< VL
Bulgaria			**0.02**												< VL
Ruse			0.02												
6160			0.01												< VL
7500			0.008												< VL
10000			0.006												< VL
15000			0.002												< VL
	350			0.005											< VL
	1440			0.003											< VL
	Bulgaria			**0.001**											< VL
	Ruse			0.001											
	3840			0.001											< VL
	6880			0.0005											< VL
	10000			0.0003											< VL
	15000			0.00009											< VL
		800			0.001										< VL
		960			0.0008										< VL
		1200			0.0005										< VL
		1570			0.0003										< VL
		2150			0.0001										< VL
		Bulgaria			**0.00005**										< VL
		Ruse			0.00005										
		3680			0.00005										< VL
		8000			0.000013										< VL
		10000			-										< VL
		15000			-										< VL

<u>**TSP**</u>

Table 57 - Variation of TSP concentration with distance from emission point

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc)				Human health						Ecosystem			Obs.
								Hourly value (µg/mc)			Daily value (µg/mc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
605				0.02				50	35	25	40	28	20				< VL
3360				0.01													< VL
Bulgaria				**0.01**													< VL
Ruse				0.01													
5390				0.006													< VL
6230				0.005													< VL
10000				0.002													< VL
15000				0.001													< VL
		875				0.002											< VL
		2730				0.001											< VL
		Bulgaria				**0.0006**											< VL
		Ruse				0.0006											
		3770				0.0006											< VL
		4800				0.0005											< VL
		10000				0.0001											< VL
		15000				0.00005											< VL
			980				0.0004										< VL
			1640				0.0001										< VL
			2680				0.00005										< VL
			Bulgaria				**0.00002**										< VL
			Ruse				0.00002										
			4260				0.00002										< VL
			10000				0.00001										< VL
			15000				-										< VL

HCl

Table 58 - Variation of HCl concentration with distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)			(µg/mc)			
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
400		0.1											
1500		0.08											
3010		0.05											
Bulgaria		**0.03**											
Ruse		0.03											
4915		0.03											
10000		0.01											
15000		0.003											
	775		0.01										
	1180		0.008										
	1760		0.005										
	Bulgaria		**0.003**										
	Ruse		0.003										
	3640		0.003										
	7370		0.001										
	10000		0.0005										
	15000		0.0003										

HF

Table 59 - Variation of HF concentration versus distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
1630		0.0006											
2185		0.0005											
2830		0.0004											
Bulgaria		**0.0001**											
Ruse		0.0001											
5500		0.0001											
10000		0.00008											
15000		0.00005											
	690		0.00008										
	895		0.00007										
	1410		0.00005										
	1680		0.00004										
	Bulgaria		**0.00002**										
	Ruse		0.00002										
	3450		0.00003										
	4950		0.00002										
	10000		-										
	15000		-										

TOC

Table 60 - Variation of TOC concentration with distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
1380		0.07											
2610		0.05											
3251		0.04											
Bulgaria		**0.03**											
Ruse		0.03											
6045		0.02											
10000		0.007											
15000		0.005											
	715		0.008										
	1300		0.005										
	3370		0.003										
	Bulgaria		**0.001**										
	Ruse		0.001										
	6390		0.001										
	7500		0.0008										
	10000		0.0005										
	15000		0.0003										

DIOXINS AND FURANS

Table 61 - Variation of PCDD & PCDF concentration with distance from emission point **(values in µg/mc x 10)$^{-6}$**

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg /mc x 10)$^{-6}$				Human health						Ecosystem			Obs.
								Value 8 hours (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[55]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
840				0.0008				0,3									< VL
1600				0.0006													< VL
2250				0.0005													< VL
2900				0.0004													< VL
Bulgaria				**0.0003**													< VL
Ruse				0.0003													< VL
5600				0.0002													< VL
	1100				0.0002												< VL
	3050				0.0001												< VL
	3300				0.00009												< VL
	Bulgaria				**0.00009**												< VL
	3750				0.00007												< VL
	Ruse				0.00007												< VL
	5030				0.00005												< VL
		900				0.00009											< VL
		1050				0.00008											< VL
		1230				0.00007											< VL
		1600				0.00005											< VL
		Bulgaria				**0.00004**											< VL
		3450				0.00003											< VL
		Ruse				0.00003											< VL
		5000				0.00002											< VL
			1680				0.00001										< VL
			Bulgaria				-										< VL
			Ruse				-										< VL

[55] there is no worldwide limit value for the concentration of dioxins and furans in immission but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

Table 62 - Variation of PCDD & PCDF concentration in relation to distance from emission point (values in pg I.TEQ/Nmc)

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (pg I.TEQ/Nmc)				Human health						Ecosystem			Obs.
								Hourly value (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[56]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
840				0.08				0,3									< VL
1600				0.06													< VL
2250				0.05													< VL
2900				0.04													< VL
Bulgaria				**0.03**													< VL
Ruse				0.03													< VL
5600				0.02													< VL
	1100				0.02												< VL
	3050				0.01												< VL
	3300				0.009												< VL
	Bulgaria				**0.009**												< VL
	3750				0.007												< VL
	Ruse				0.007												< VL
	5030				0.005												< VL
		900				0.009											< VL
		1050				0.008											< VL
		1230				0.007											< VL
		1600				0.005											< VL
		Bulgaria				**0.004**											< VL
		3450				0.003											< VL
		Ruse				0.003											< VL
		5000				0.002											< VL
			1680				0.001										< VL
			Bulgaria				-										< VL
			Ruse				-										< VL

[56] there is no worldwide limit value for the concentration of dioxins and furans in immission but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

Impact on population health across borders

Centralisation of data obtained from mathematical modelling of pollutant dispersion in the atmosphere:

CARBON MONOXIDE (CO)

Table 63 - Variation of CO concentration with distance from emission point

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc)				Human health						Ecosystem			Obs.
								Hourly value (µg/mc)			Daily value (µg/mc)						
	8 h	24 h	1 year		8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
	Bulgaria[57]				**0.1**						10000	7000	5000				<<< VL
	Ruse[58]				**0.1**												<<< VL
		Bulgaria				**0.03**											<<< VL
		Ruse				**0.03**											<<< VL
			Bulgaria				**0.001**										<<< VL
			Ruse				**0.001**										<<< VL

NO_2

Table 64 - Variation of NO_2 concentration with distance from the emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value[59] (µg/mc)			Annual value (µg/mc)						
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria			**0.4**				200			40					<<< VL
Ruse			**0.4**												<<< VL
	Bulgaria			**0.03**											<<< VL
	Ruse			**0.03**											<<< VL
		Bulgaria			**0.001**										<<< VL
		Ruse			**0.001**										<<< VL

[57] at the border with Bulgaria at a distance of 3317 m
[58] at the border of the residential area of Ruse at a distance of 3856 m
[59] European Environment Agency - Nitrogen dioxide - Annual limit values for the protection of human health

SO_x

Table 65 - Variation of SO_2 concentration with distance from emission point

Propagation distances (m)			Concentrations determined by mathematical dispersion modelling (µg/mc)			Human health						Vegetation			Obs.
						Hourly value (µg/mc)			Daily value (µg/mc)			Annual value (µg/mc)			
1 h	24 h	1 year	1 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria			**0.02**			350			125	75	50	20	12	8	< LV
Ruse			**0.02**												
	Bulgaria			**0.001**											< LV
	Ruse			**0.001**											
		Bulgaria			**0.00005**										< LV
		Ruse			**0.00005**										

TSP

Table 66 - Variation of TSP concentration with distance from emission point

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc)				Human health						Ecosystem			Obs.
								Hourly value (µg/mc)			Daily value (µg/mc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0.01**				50	35	25	40	28	20				< VL
Ruse				**0.01**													
		Bulgaria				**0.0006**											< VL
		Ruse				**0.0006**											
			Bulgaria				**0.00002**										< VL
			Ruse				**0.00002**										

HCl

Table 67 - Variation of HCl concentration with distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling **(µg/mc)**		Human health						Vegetation			Obs.
				Hourly value **(mg/mc)**			Annual value (mg/mc)			(µg/mc)			
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.03**		1490	74,52	52							<<< VL
Ruse		**0.03**											<<< VL
	Bulgaria		**0.003**										<<< VL
	Ruse		**0.003**										<<< VL

According to data from the world scientific literature[60] , the following conclusions have been reached after numerous researches:

EFFECT ON HUMANS

Single exposure

The National Research Council has reviewed the toxicological effects of HCl in humans (NRC 1987, 1991). Reports have concluded that exposure to irritating concentrations of HCl can lead to coughing, pain, inflammation, oedema and flaking in the upper respiratory tract. Acute exposure to high concentrations could cause constriction of the larynx and bronchi and closure of the glottis. Because HCl is highly irritating to the mucous surfaces of the respiratory tract and to the eyes, HCl has good warning properties.

Henderson and Haggard (1943) summarized information from several sources on the length of time various concentrations of HCl exposure could be tolerated by healthy workers and the effects that might occur (Table D-1). Matt (1889) stated in his doctoral thesis that work is impossible when inhaling air containing HCl at concentrations of 50 to 100 ppm; work is difficult but possible when the air contains concentrations of 10 to 50 ppm; and work is unworkable at 10 ppm. However, the exposure protocol used by Matt (1889) included only two individuals and three exposure concentrations. Each individual was exposed once to HCl at 10 ppm (10 min), 70 ppm (15 min) and 100 ppm (15 min). When exposed to 70 ppm, individuals left the exposure chamber once briefly during the 15-min period, and when exposed to 100 ppm, they left several times due to acute discomfort. During exposure to high concentrations, individuals experienced coughing, an increase in breathing rate and severe irritation of the throat and respiratory tract. Matt (1889) included in his report a description by another researcher of another volunteer exposed to HCl at 50 ppm for 13 minutes. Heyroth (1963) indicated in an editorial note that, in his opinion, most people can detect HCl in the air at 1-5 ppm and that 5-10 ppm is an unpleasant exposure concentration. Elkins (1959) was of the opinion that exposure to HCl at 5 ppm is immediately irritating to the nose and throat but without long-lasting effects. Sayers et al. (1934) expressed the opinion that prolonged exposure to 1-5 ppm resulted in mild symptoms, exposure to 5-10 ppm for 1 hour was the maximum exposure concentration without serious effects, and 150-200 ppm was dangerous in 30-60 min.

TABLE D-1 Interpretations of Various HCl Exposure Concentrations in the Workplace

HCl Concentration, ppm	Exposure Duration	Physiological Responses	References
1,000-2,000	Brief	Dangerous for even short exposures	Henderson and Haggard 1943
50-100	1 hr	Maximum tolerable concentration	Henderson and Haggard 1943
10-50	A few hr	Maximum tolerable concentration	Henderson and Haggard 1943
35	Unspecified short time	Irritation of throat	Henderson and Haggard 1943
10	Prolonged	Maximum allowable concentration	Henderson and Haggard 1943
1-5	—	Odor threshold	Heyroth 1963

[60] Assessment of Exposure-Response Functions for Rocket-Emission Toxicants. National Research Council (US) Subcommittee on Rocket-Emission Toxicants. Washington (DC): National Academies Press (US); 1998.

PHYSICAL AND CHEMICAL PROPERTIES

CAS No.:	7647-01-0
Molecular formula:	HCl
Molecular weight:	36.47
Chemical name:	Hydrogen chloride
Synonyms:	Muriatic acid, spirits of salt, chlorohydric acid, hydrochloric acid gas
Physical state:	Gas
Boiling point:	-84.9°C
Melting point:	-144.8°C
Vapor density:	1.26 (air = 1.0)
Vapor pressure:	40 mm Hg at 17.8°C
Solubility:	Highly soluble in water, forming hydrochloric acid (82.3 g/100 g of water at 0°C)
Color:	Colorless as a gas
Conversion factors	1 ppm = 1.49 mg/m^3 at 25°C, 1 atm:
1 mg/m^3 = 0.671 ppm	

HF

Table 68 - Variation of HF concentration versus distance from the emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.0001**		36000	20000	800							<<< VL
Ruse		**0.0001**											<<< VL
	Bulgaria		**0.00002**										<<< VL
	Ruse		**0.00002**										<<< VL

According to data from the world scientific literature[61] , the following conclusions have been reached after numerous researches:

TABLE 3–1 Summary Table of AEGL Values (ppm [mg/m^3])

Classification	10 min	30 min	1 h	4 h	8 h	End Point (Reference)
AEGL-1 (Nondisabling)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	1.0 (0.8)	Threshold, pulmonary inflammation in humans (Lund et al. 1997, 1999)
AEGL-2 (Disabling)	95 (78)	34 (28)	24 (20)	12 (9.8)	12 (9.8)	NOAEL for lung effects in cannulated rats (Dalbey 1996; Dalbey et al. 1998a);[a] sensory irritation in dogs (Rosenholtz et al. 1963)[b]
AEGL-3 (Lethal)	170 (139)	62 (51)	44 (36)	22 (18)	22 (18)	Lethality threshold in cannulated rats (Dalbey 1996; Dalbey et al. 1998a);[c] lethality threshold in mice (Wohlslagel et al. 1976)[d]

a 10-min AEGL-2 value.

b 30-min and 1-, 4-, and 8-h AEGL-2 values.

c 10-min AEGL-3 value.

d 30-min and 1-, 4-, and 8-h AEGL-3 values.

Abbreviations: mg/m^3, milligrams per cubic meter; ppm, parts per million.

TABLE 3–2 Chemical and Physical Data for Hydrogen Fluoride

Parameter	Value	Reference
Synonyms	Hydrofluoric acid gas, anhydrous hydrofluoric acid	Budavari et al. 1996
Molecular formula	HF	Budavari et al. 1996
Molecular weight	20.01	Budavari et al. 1996
CAS Registry Number	7664–39–3	Budavari et al. 1996
Physical state	Gas	Budavari et al. 1996
Color	Colorless	Budavari et al. 1996
Solubility in water	Miscible in all proportions	Perry et al. 1994
Vapor pressure	760 mm Hg at 20°C	ACGIH 2002
Density (water=1)	1.27 at 34°C	Perry et al. 1994
Melting point	−87.7°C	Perry et al. 1994
Flammability	Not flammable	Weiss 1980
Boiling point	19.5°C	Perry et al. 1994
Conversion factors	1 ppm=0.82 mg/m^3 1 mg/m^3=1.22 ppm	ACGIH 2002

HUMAN TOXICITY DATA

2.1 Acute lethality

No data have been located on human deaths from inhalation exposure to HF alone. However, several studies indicate that humans have died from accidental exposure to hydrofluoric acid (Kleinfeld 1965; Tepperman 1980; Braun et al. 1984; Mayer and Gross 1985; Chan et al. 1987; Chela et al. 1989; ATSDR 1993). These accidents involved acute inhalation of HF in combination with dermal exposure involving severe skin damage. Deaths were attributed to pulmonary oedema and cardiac arrhythmias, the latter being the result of acidosis due to hypocalcaemia and hypomagnesaemia pronounced following dermal fluoride absorption. Doses or exposure levels could not be determined.

[61] Acute Exposure Guideline Levels for Selected Airborne Chemicals: Volume 4 - National Research Council (US) Subcommittee on Acute Exposure Guideline Levels Washington (DC): National Academies Press (US); 2004.

2.2 Non-lethal toxicity

Ronzani (1909) and Machle et al. (1934) cite the first reports in which a HF concentration of 0.004% (40 ppm) was used in the treatment of tuberculosis. Exposure times were not specified. The sharp, irritating odour of HF is perceptible at 0.02-0.13 ppm (Sadilova et al. 1965; Perry et al. 1994).

TOC

Table 69 - Variation of TOC concentration with distance from emission point

Propagation distances (m)		Concentrations determined by mathematical dispersion modelling (µg/mc)		Human health						Vegetation			Obs.
				Hourly value (µg/mc)			Annual value (µg/mc)						
30 min	24 h	30 min	24 h	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria		**0.03**											
Ruse		**0.03**											
	Bulgaria		**0.001**										
	Ruse		**0.001**										

DIOXINS AND FURANS

Table 70 - Variation of PCDD & PCDF concentration with distance from emission point **(values in µg/mc x 10)$^{-6}$**

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (µg/mc x 10)$^{-6}$				Human health						Ecosystem			Obs.
								Value 8 hours (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[62]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0.0003**				0.3									< LV
Ruse				**0.0003**													< LV
	Bulgaria				**0.00009**												< LV
	Ruse				**0,00007**												< LV
		Bulgaria				**0,00004**											< LV
		Ruse				**0,00003**											< LV
			Bulgaria				-										< LV
			Ruse				-										< LV

[62] there is no worldwide limit value for the concentration of dioxins and furans in immission, but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

Table 71 - Variation of PCDD & PCDF concentration in relation to distance from emission point (values in pg I.TEQ/Nmc)

Propagation distances (m)				Concentrations determined by mathematical dispersion modelling (pg I.TEQ/Nmc)				Human health						Ecosystem			Obs.
								Hourly value (pg I.TEQ/Nmc)			Daily value (pg I.TEQ/Nmc)						
1 h	8 h	24 h	1 year	1 h	8 h	24 h	1 year	limit values[63]	upper threshold	lower threshold	limit values	upper threshold	lower threshold	limit values	upper threshold	lower threshold	
Bulgaria				**0.03**				0.3									< LV
Ruse				**0.03**													< LV
	Bulgaria				**0,009**												< LV
	Ruse				**0.007**												< LV
		Bulgaria				**0.004**											< LV
		Ruse				**0.003**											< LV
			Bulgaria				**-**										< LV
			Ruse				**-**										< LV

The centralisation of the above information is presented in tabular form:

Table 72: concentration values in immission at Ruse city boundary

Pollutant	mediation period (µg/mc)			lower threshold (µg/mc)			upper threshold (µg/mc)			limit values (µg/mc)		
	1 h	8 h	24 h	1 h	8 h	24 h	1 h	8 h	24 h	1 h	8 h	24 h
CO			0.03			5000						
NO_2	0.4											
SO_X	0.02		0.001			50	200			350		
TSP	0.1		0.0006	25		20						
HCl	0.03			52×10^3								
HF	0.0001			800								
dioxins and furans **values expressed in (pg I.TEQ/Nmc)**	0,007									0.3		

[63] there is no worldwide limit value for the concentration of dioxins and furans in immission, but studies recommend 0.3 pg I.TEQ/Nmc - (U.S. Environmental Protection Agency) for an 8-hour averaging period

The conclusions of the information presented above on the transboundary impact of incinerator operation on the human health of the inhabitants of the city of Ruse are as follows:

1. CO - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the lower threshold values for human health. The impact of the incinerator operation on the health of the inhabitants of the city of Ruse will be neutral.
2. NO_2 - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the upper human health threshold. The impact of the incinerator operation on the health of the inhabitants of the city of Ruse will be neutral.
3. SO_X - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the limit values for the 1 h averaging period and the lower threshold values for the 24 h averaging period (related to human health). The impact of the operation of the incinerator on the health of the inhabitants of Ruse will be neutral.
4. TSP - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the lower threshold values for the 1 h averaging period and the lower threshold values for the 24 h averaging period (related to human health). The impact of the incinerator operation on the health of the inhabitants of Ruse will be neutral.
5. HCl - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the lower threshold values for human health. The impact of the incinerator operation on the health of the inhabitants of Ruse will be neutral.
6. HF - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the lower threshold values for human health. The impact of the incinerator operation on the health of the inhabitants of Ruse will be neutral.
7. dioxins and furans - the values recorded for concentration in immission at the Romanian boundary of Ruse are well below the limit values for human health. The impact of the incinerator operation on the health of the inhabitants of Ruse will be neutral.

4. I draw attention to the fact that IP will be an intensive and long-term source of organised emissions of air pollutants. The EIA report does not provide information on the health and environmental consequences of possible accidents and failures of the rotary combustion chamber and gas filtration plant.

Answer:

The IP will not be an "*intensive source*" of "*organised emissions of air pollutants*" (see calculations and results from mathematical modelling).

Throughout the analysis and assessments in the EIR, the occurrence of malfunctions or possible accidents has been analysed and the modes of action have been presented, as well as the fact that the technology to be used, the automation system and the safety system will prevent the plant from operating outside normal parameters

5. On page 28 of the environmental impact assessment, it is stated that the plant will use a "dry absorption system" type of flue gas cleaning by injecting Solvay-Bicar dry reagent ($NaHCO3$ mixed with activated charcoal) into the exhaust gas stream, taking into account that in table no. 113100 "Techniques to reduce organised air emissions of HCl, HF and SO2 from waste incineration" on page 243 and in table no. 118103 on page 248 of the EIA report (in the last column of the row "Injection of dry sorbent"), the text "Not applicable" should be corrected to "It is foreseen in the investment proposal".

Answer:

This typo has been corrected.

6. When assessing impacts, a distinction should be made between ambient air quality (AQA), i.e. the impact of IP on AQ, and an assessment of the impact of emissions on human health. The human health impact assessment refers to the characteristics of the different hazardous substances emitted and their modes of action on the human body.

The measures set out in the EIA report for the avoidance, prevention and mitigation of adverse impacts in the event of an accident are derived from the relevant regulatory requirements for all projects and are of a general, declaratory nature. The measures presented in the report do not include any measures to ensure the continuous, correct and accident-free operation of the treatment facilities of the proposed flue gas cleaning system. It is essential that all treatment plants achieve compliance with the emission limit values during their entire period of operation. These values are guaranteed by the contractor to be achieved with the treatment plants installed and have been the basis for the mathematical modelling and computer modelling of the air emission distribution. Taking into account the nature of the production activities, it can be summarised that the most serious potential impacts, including those resulting from emergencies and abnormal operating regimes, cover the environmental components. In the described measures, there is no provision for the protection of ambient air purity, but only a statement that the concentrations of pollutants in the atmosphere, as determined by mathematical dispersion modelling, are significantly below the limit values and that no measures need to be taken.

Answer:

It was presented in the EIR that the plant will be equipped with a fully automated continuous emission concentration monitoring system for all pollutants required to be monitored. At the same time, it was stated that in the event of values outside the permissible ranges, the automation system will correct the technical parameters of the plant for any of the pollutants monitored and, if the values in question are not corrected within the permissible range, the plant will be shut down in order to detect and remedy the fault as follows:

Pages 26-27:

"*Dry" flue gas cleaning/washing system*

This system includes:

a) - flue gas cooling system;
b) - the flue gas cleaning system, of the "dry absorbing system" type;
c) - dry particle filtration system;
d) - exhaust fan for exhausting combustion gases;
e) - flue gas chimney and chimney connection.

The flue gas is introduced in a controlled and directed way into the flue gas cleaning system, of the "dry absorbing system" type, in a reactor, specially dimensioned for this purpose, where the Solvay-Bicar mixture (NaHCO3 mixed with activated carbon) is injected through a nozzle. when it meets the flue gas with the sorbent in the powder phase in suspension and combines as the chemical reaction of pollutant absorption takes place, resulting in a powder which is then collected in the lower part of the reactor without the need for additional drying of the depollutant. The installation of such a system for the removal of pollutants from the flue gas by means of a dry absorbing system is designed and dimensioned to limit the discharge of pollutants and dust particles into the atmosphere in such a way as to comply with emissions into the atmosphere in accordance with the legislation in force (HG 128/2002, supplemented and updated with HG 268/2005).

In the event of abnormal operation of the gas flushing system which may lead to malfunctions, the electronic monitoring system will signal a potential malfunction in good time and the necessary corrective measures will be taken.

Following the flue gas cleaning system, the dry filter system and then the exhaust will be installed.

The dry particle filtering system is equipped with a bag filter.

Technical features are:

- filtered flow 5000 m^3 /h
- filtered surface 360 m^2
- type of filter material filter bags made of FNS® (P84, glass fibre, PTFE)
- maximum operating temperature T max.(continuous) = 190 C°
- pressure drop 50-150 mmH O_2

The dry particle filtration system consists of a 144-bag filter, which is cleaned with counter current air, resulting in a filtered air flow of 10000 m³/h. This flow rate is calculated to take up the load peaks that occur when the incineration process starts. At this point any volatile fractions in the waste to be incinerated ignite almost instantaneously and generate a volume of flue gas above the working flow rate of 5000 m^3 /h. The duration of the phenomenon is very short, in the order of 1 to 5 minutes, after which the normal working flow returns.

The life of a filter bag is 6000 hours after which it must be replaced.

Exhaust gas exhauster

Technical characteristics for the exhaust gas exhauster are:

- centrifugal fan type T_{max} = 350° C (with cooling fan) with electric motor
- Suction/discharge dimensions: Ø 406 mm / 355 x 250 mm.

The exhausters' system for the flue gas discharge consists of a centrifugal fan with cooling fan, which has a flow rate of 10000 m³/h. This flow rate has been dimensioned to take up the load peaks that occur at the start of the incineration process (see paragraph above)."

Pages 86-87:

"In the event of a breakdown leading to an emergency shutdown of the incinerator (which is highly unlikely) the operating protocol will include the following phases:

1. when the incinerator stops suddenly (due to a malfunction) the LPG supply to the burners will automatically stop (process coordinated and controlled by the process computer-aided automation system). In this case the combustion process will also stop,

which will stop the flue gas generation process.

2. the 2 combustion chambers are let to cool down
3. all flue gases that will be released before the combustion chambers cool down will pass through the gas scrubber and filter system and then be discharged into the atmosphere through the incinerator stack. The quantities of such gases will be very small and will have no impact on the environmental factor air
4. the cause of the stoppage is determined, the fault is identified and the technical measures to remedy the fault are determined. the combustion chambers (primary and/or secondary) will only be opened if absolutely necessary. Taking into account the construction and operating principle of the incinerator, it is unlikely that a fault will occur inside one of the two combustion chambers that would lead to an abrupt shutdown of the incinerator.
5. after the fault has been rectified, the condition of the system and of the entire incinerator is checked by computer diagnosis, after which the incinerator is restarted in accordance with the start-up procedure in the technical book

For situations where incinerator malfunctions occur, they will be reported in advance by the automated monitoring system, in which case the procedural steps below apply:

1. the supply of waste to the primary chamber is stopped (continuous supply system)
2. the incineration process is completed for the entire quantity of waste in the primary combustion chamber
3. the LPG supply to the combustion system in the 2 chambers of the incinerator is switched off
4. the 2 chambers of the incinerator are let to cool down
5. the fault will be identified and the technical repair solution and working procedure will be determined
6. malfunction is rectified
7. the incinerator is restarted following the start-up procedure in the technical book

In this situation, no pollutants are emitted into the atmosphere at levels above those typical of normal operation.

In the event of a fault in the electricity supply to the site, the following procedural steps are taken:

- automatically starts the electric generator
- the supply of waste to the primary combustion chamber is stopped
- the incineration of existing waste in the primary chamber will be completed
- the procedure for shutting down the incinerator is initiated
- the power grid is expected to come back on
- the technical condition of the incinerator is checked and restarted following the procedural steps in the technical book.

The running time of the generator will be limited by the time of completion of the incineration of the waste in the primary chamber at that time (with the waste supply switched off) after which it will stop waiting for the power supply to return from the grid. As such the amount of exhaust gas generated will be reduced. Combined with the minimum EURO 5 pollution level of the thermal engine with which the generating set will be equipped, the quantities of pollutants emitted into the atmosphere during operation of the generating set will be very low and without significant negative impact on the environmental factor air."

Pages 178-180:

"Due to the fact that the incinerator is equipped with:

- secondary combustion chamber
- dry absorbing gas cleaning system
- bag filtration system

emission levels for different types of pollutants respectively:

- organic substances in the gaseous or vaporous state, expressed as total organic carbon (TOC)
- hydrofluoric acid (HF)
- hydrochloric acid (HCl)
- sulphur dioxide (SO)2
- nitrogen dioxide (NO)2
- total dust (TSP)
- dioxins and furans

is very low and below the maximum allowable limits. For the mathematical modelling of the dispersion of these pollutants in the atmosphere, the values in the incinerator technical book and in the literature[64] were used.

Table 73 - Maximum values of pollutants emitted into the atmosphere at the outlet of incinerators with secondary combustion chamber

Parameter	VLE[1]	Maximum values measured at incinerators
Solid particle	10 mg/m³	1.2 mg/m³
Sulphur dioxide	50 mg/m³	2.4 mg/m³
Nitrogen Dioxide*	200 mg/m³	60 mg/m³
HCl	10 mg/m³	5.38 mg/m³
HF	1 mg/m³	0.04 mg/m³
TOC	10 mg/m³	4.6 mg/m³
CO		78.3 mg/m³

Concerning nitrogen oxides (NO_X):

Low NO_x burners are used to reduce NO_x emissions. It is estimated that the permissible emission limits will not be exceeded. Cf. Law 278/2013, Annex 6, the permitted limit value for NO_x for incinerators with a nominal capacity less than or equal to 6 tonnes per hour is 400 mg/Nmc.

Concerning sulphur dioxide (SO_2):

Sulphur oxide emissions are mainly caused by the presence of sulphur in the fuel... Therefore, the use of gaseous fuel will result in insignificant SO2 emissions. (Cf. Law 278/2013, Annex 6, the permissible limit value for sulphur dioxide at waste incinerators is 50 mg/Nmc for the reference value of 3% O_2);

Regarding powders: It is estimated that the combustion of purified gas is not a significant source of dust emissions. Cf. Law 278/2013, Annex 6, the permissible limit value for dust at waste incinerators is 30 mg/Nmc (100% A) or 10 mg/Nmc (97% B) - average emission limit values for half an hour.

The total dust concentration of the air emissions of the incinerator shall in no case exceed 150 mg/Nm^3 , expressed as a half-hour average.

Concerning carbon monoxide (CO):

Carbon monoxide always occurs as an intermediate product of the combustion process, especially under substoichiometric combustion conditions. The reduction of CO concentrations resulting from the combustion process will be achieved by combustion control and monitoring.

[64] U.S. Environmental Protection Agency; Inciner8.com; NCBI - Waste Incineration & Public Health; Water, Sanitation and Health Protection of the Human Environment World Health Organization Geneva - Findings on an Assessment of Small-cale Incinerators for Health-care Waste

[1] average daily emission values according to Annex 6, L 278/2013

After commissioning, emissions at the flue gas stack will be monitored to verify the evaluated data and compliance with the limits allowed by Law 278/2013. The limits will be complied with (except for the start-up and shut-down phase):

- 50 mg/Nm^3 in combustion gas determined as average daily value;
- 100 mg/Nm^3 in combustion gas from all measurements (determined as half-hourly averages taken over 24 hours);
- 150 mg/Nm^3 in the combustion gas in at least 95% of all measurements (determined as 10-minute averages).

To assess values:

1. average values in half an hour for pollutants:
    - organic substances in the gaseous or vaporous state, expressed as total organic carbon (TOC)
    - hydrofluoric acid (HF)
    - hydrochloric acid (HCl)
2. daily average values for pollutants:
    - organic substances in the gaseous or vaporous state, expressed as total organic carbon (TOC)
    - hydrofluoric acid (HF)
    - hydrochloric acid (HCl)
    - sulphur dioxide (SO_2)
    - nitrogen dioxide (NO_2)
    - total dust (TSP)
3. average values over a sampling period of minimum 6 hours and maximum 8 hours for pollutants:
    - dioxins and furans

measurements will be carried out during the operation of the incinerator, as no information other than that in the technical books of the equipment is available at this time and that the values indicated in L 278/2013, point 1.4, part a-3-a, Annex 6, respectively, must not be exceeded:

Table 74 - Half-hourly average emission limit values (mg/Nmc)

Pollutant	(100%) A	(97%) B
Total dust	30	10
Organic substances in the gaseous or vaporous state, expressed as carbon total organic (TOC)	20	10
Hydrochloric acid (HCl)	60	10
Hydrofluoric acid (HF)	4	2
Sulphur dioxide (SO_2)	200	50
Nitrogen monoxide (NO) and nitrogen dioxide NO_2 expressed as NO_2 for existing waste incineration plants with a nominal capacity exceeding 6 tonnes per hour or for new waste incineration plants	400	200

Table 75 - Daily average emission limit values

Pollutant	(mg/Nmc)
Total dust	10
Organic substances in the gaseous or vaporous state, expressed as carbon	10

total organic (TOC)	
Hydrochloric acid (HCl)	10
Hydrofluoric acid (HF)	1
Sulphur dioxide (SO)2	50
Nitrogen monoxide (NO) and nitrogen dioxide NO_2 expressed as NO_2 for existing waste incineration plants with a nominal capacity exceeding 6 tonnes per hour or for new waste incineration plants	200
Nitrogen monoxide (NO) and nitrogen dioxide NO_2 expressed as NO_2 for existing waste incineration plants with a nominal capacity of less than 6 tonnes per hour	400

This report does not comprehensively address all air pollutants on both sides of the Danube, which makes it incomplete and does not provide reliable data on the extent and overall quotient of transboundary pollution. Given the fact that the Ruse area is home to industries, particularly in the chemical, metallurgical, oil refining, automotive and ceramics industries, the conclusions drawn are unreliable and unacceptable.

All conclusions in the Report are rather declarative and not conclusive, as there is a possibility of mixing of pollutants in the atmosphere and, together with the high humidity (typical for the Danube area), there is a risk of formation of new pollutants, their retention in the atmospheric layer near the ground and the risk of exposure of the population of Ruse. The analyses and conclusions drawn do not conclusively prove the absence of a risk to the health of the population of Ruse as a result of the implementation of the investment proposal, nor do they propose effective measures to reduce the negative impact. The basic principle in the protection of public health is the precautionary principle, i.e. the prevention of harmful effects.

Answer:

EIR has analysed all the pollutants generated by the operation of the plant, evaluated all aspects related to their accumulation and dispersion in the atmosphere, calculated and analysed the level of immission concentrations for each pollutant and revealed that at the border between Romania and the Republic of Bulgaria the immission concentration values of each pollutant analysed are at the level of imperceptible.