INTEGRATED WASTE MANAGEMENT ISSUES IN TIMIS COUNTY THROUGH THE NON-HAZARDOUS WASTE LANDFILL ON THE ADMINISTRATIVE TERRITORY OF GHIZELA COMMUNE

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Abstract: *The current paper focuses on the main geomorphological and geological, hydrographic and hydrological characteristics, as well as the main indicators of echopedological characterization and how they are manifested in the area under study, as well as a series of elements relating to the current situation of waste management in Timis County, or the composition and protection of basic and auxiliary components of the landfill, as well as a series of technical solutions for control and prevention of risk situations, the fruit of a laborious activity of observation, studies and research in interdisciplinary fields.In order to manage waste (estimated at 9.58 million tons of which 7.66 million tons of household waste) as correctly and efficiently as possible, in compliance with the European Union standards, an integrated waste management system co-financed by European funds was implemented in the Timis County, covering the entire area of the Timis County, respecting the 99 administrative units, representing 100% coverage of the county with sanitation services, divided into 5 collection areas:0 Ghizela, 1 Timisoara, 2 Jimbolia, 3 Deta, 4 Faget, superimposed on the three geomorphological sectors specific to Timis County.The importance of the subject matter derives from the fact that in addition to the requirements for food, clothing and wood, the natural environment is required by man for more and more different requirements, being used to a large extent as a place for multiple and diverse social-economic activities for various constructions, recreational spaces, platforms and places for the storage of many wastes and residues.The aim of the research undertaken originates from scientific and practical research on the accumulation of knowledge in which, through various technological and organizational measures, it is possible to reduce the area to be treated with residues by 30%, thus reducing possible pressures on the quality of the environment.*

Keywords*: waste, land, soils, management, quality*

INTRODUCTION

Emerging in a world dominated by plants and animals, man integrated himself into nature, thus into the environment, respecting at first the laws of nature, and then modifying the environment in his own interest. The use of the land, with the ever-increasing population, has become more and more complex, transforming it from an object of work and means of production into agriculture and forestry, into a source of raw materials for the manufacturing industry and a physical and geographical space for the location of all the objectives necessary for the development of human society (buildings, roads, water reservoirs, dams, recreational areas, platforms and dumping sites for a wide range of waste and residues)..

The issue of the negative impact on the environment and human health as a result of the disposal of waste using inappropriate methods and technologies remains topical, especially in the context of the sustained trend of increasing quantities of waste generating pollution and a loss of resources, for which it is necessary to achieve economic growth in full accordance with the requirements of conservation and protection of the environment.

In this context, the paper presents the "Ghizela Non-Hazardous Waste Landfill" starting with the location (location in the physical-geographical space, legal situation), the

investment opportunity (with reference to the normative acts in force), the water supply (drinking water, water at the hydrant, rainwater, waste water) and continuing with "Technical elements on the construction and protection of the basic and auxiliary components of the storage facility" making technical references to both the rainwater collection system (rainwater collection and disposal channels, the construction of the landfill itself (preparation of the landfill surface, removal of the vegetation layer, construction of the support embankment, landfill support fill, natural mineral insulation of the landfill, HDPE geomembrane, mechanical protection by geotextiles, landfill leachate disposal system, leachate collection basin, leachate treatment system, landfill gas recovery and disposal, etc.).

Numerous studies and researches at national level have shown that there are complex interdependent relationships between agricultural technological waste management systems, the state of the environment (soil, water, air, plants, etc.), the level of economic development and the quality of life.

MATERIAL AND METHODS

The issue addressed refers to the fenced area of 59.80 ha, but also to the area located in the immediate vicinity of the deposit and the pipeline for the discharge of conventional clean water into the Timiș River, with a length of approx. 9,00 km

The research of the echopedological conditions was carried out in accordance with the "Methodology for the Elaboration of Pedological Studies" (vol I, II, III) elaborated by ICPA Bucharest in 1987, supplemented with specific elements from the Romanian Soil Taxonomy System (SRTS-2003/2012), as well as other normative acts updated by M.A.A.P. Order 223/2002, respectively MADR Order 278/2011, based on the pedological information accumulated in the OSPA archive in Timisoara studies that were supplemented with some elements recently collected from the field and processed in the laboratory and office.

Analyses and other determinations were performed in the physical-chemical analysis laboratory "O.S.P.A-U.S.V.T", Faculty of Agriculture, USVT Timisoara, Calea Aradului, no. 119, RENAR accredited according to STAS SR EN ISO/CEI 17025, by accreditation certificate no. LI 1001/2013.

RESULTS AND DICUSSIONS

Administrative and physical-geographical location of the warehouse

The non-hazardous waste landfill in Ghizela village with an area of 58.9 ha (cadastral no. A 1438, A 1426), is part of the public domain being the property of Ghizela commune. 34/17.09.2010), the choice of the location was based on the requirements of GD no. 349/2005, regarding the distances of the waste landfills from inhabited areas and water courses.

The nearest human settlement is the village of Șanovița, 1.5 km west of the site, and the nearest watercourse (350 m) is the Minișul Mort stream. Road access to the site is via a road about 2.4 km long connected to the county road DJ 609A in the locality of Șanovița.

From a geomorphological point of view, the site is located in the middle part of the Bega corridor in an alluvial floodplain on recent (Pliocene-Quaternary) fluvial-lacustrine deposits, with numerous puddles and deserted streams (with extensions along the Miniș, Chizdia and Hisiaș streams) at the transition to the sub-hilly piedmont plain with diverging valleys and fan-shaped terraces developed in the areas of contact with the Lipova Hills (Coteț, 1973).

The land in the area of the Ghizela non-hazardous waste landfill site has a gently undulating flat aspect, which, according to the topographic survey, has a uniform slope in the NE - SV direction, in the N - S direction the slope is between 0.150 - 0.200 % and in the E - V direction 0.085 -0.145 %.

From a geological point of view, the investigated area is part of the Pannonian Tectonic Depression zone, which is composed of Quaternary, Tertiary and Mesozoic formations overlying a crystalline Carpathian basement that has been submerged in the Miocene at different depths, fragmented by faults with the local appearance, at the surface, of basaltic formations (Șanoviţa-Lucareţ) and the appearance of mineral thermal waters in the Buziaș area.

The crystalline bedrock is discordantly overlain by a Pliocene-Quaternary sedimentary cover of variable thicknesses in a succession of clay, sand and gravel deposits. over which alluvial materials with thicknesses from 50 to 80 m have been deposited, with loessoid deposits in the upper part.

The granularity of Pleistocene formations allows good infiltration and accumulation of water giving to important aquifers identified by drilling at depths of ca. 100 m. Along the ridges and embankments, aquifers are developed in sand and gravel with Holocene age gravels, with flows up to 1.0 l/s.

In the area of the Ghizela Non-Hazardous Waste Landfill site, the first groundwater formations are sand and gravels found at depths between 7.30 and 12.00 m.

The water confined within these layers has an upward character, with seepage into the borehole at a depth of ca. 5.00 m and with stabilization at a depth of 0.90 - 1.40 m, in case of drilling the compact clay layer (Murariu, 2011).

The Ghizela administrative territory is part of the south-western group of hydrographic systems, the Timiș - Bega hydrographic basin. The main watercourses in the area of the site are: about 500 m to the west, the Chizdia stream, and 350 m to the east, the Miniș stream, tributaries of the right bank of the Bega river.To the south of the site, at a distance of about 1.10 km, flows the Bega River, and about 4 km away is the Timiș River.

The macroclimatic particularities of Timis County, in whose area the mentioned site is located, are determined by its geographical position in the European continent, to which is specific a certain circulation of air masses of various types, a circulation impressed either by centres of action of dynamic origin (Azorean and subtropical anticyclone), or by seasonal thermal action centres (Siberian anticyclone, Asian or Mediterranean low), the area in question being subject to the interference of maritime air masses of western origin and continental air masses of eastern origin, as well as to the invasion of warm southern air masses crossing the Mediterranean.

The air temperature shows only a slight difference due to the terrain configuration,

annual averages being around 11.0 0C (10.9^0 C in Timisoara and 10.7^0 C in Lugoj), dropping by 1-2^0 C in the eastern hills.

Precipitation shows variations even in the lower areas and significant increases in the hills, the average annual precipitation amounts are: 734.0 mm in Fãget, 725.9 mm in Lugoj and 605.6 mm in Timișoara.

In close correlation with the diversity of landforms, with the variability of climate and vegetation conditions, with the evolution over time, under the various anthropic interventions within the investigated area, the main formation and evolution processes have shown a different development and intensity, the result of which are different genetic soil types (related

or totally different) in continuous evolution, so that the following soil types have been identified in the depositional area: alluvium, eutricambosol and pelosol.

Alluvial soils are soils developed from alluvial parent material (including colluvium or gravel) at least 50 cm thick and having at most one ***A*** horizon (Am, Au, Ao). They have no other horizons or diagnostic properties apart from at most one horizon with contractile-swelling properties associated with the C horizon, salsodic properties (hyposalic, hyponatric horizon in the first 100 cm or natric horizon below 50 cm depth and gleic properties (Gr horizon) below 50 cm (SRTS-2012).

The texture of the alluvial soils depends on that of the parent materials and differs on the profile in relation to the alternation of stratifications specific to alluvial deposits, as well as the main physical-mechanical, hydro-physical and chemical characteristics (Table 1- OSPA Timisoara).

Also the level of pedophreatic water present between 1-2 m in the depositional area directly influences pedogenesis.

Table 1

Main physico-mechanical, hydro-physical and chemical characteristics of the alluvial soil from Ghizela, Timiș County

Horizons	**UM**	**Aț**	**At**	**Cg_2**	**Cy g_{22}**	**Cyg_3**	**Cyg_4**	**Ckg_5**	**Cg_5**
Depth	**cm**	**0-4**	**-17**	**-38**	**-74**	**-120**	**-135**	**-170**	**200**
Coarse sand (2.0 - 0.2 mm)	%	3,0	3,3	5,5	4,5	3,0	2,1	2,2	2,2
Fine sand (0,2 -0,02 mm)	%	34,4	32,6	31,0	25,1	27,3	28,4	30,2	29,8
Dust (0,02 - 0,002 mm)	%	29,1	29,2	28,0	26,3	22,6	22,3	19,8	21,1
Colloidal clay (below 0,002 mm)	%	33,5	34,9	35,5	44,1	47,1	47,2	47,8	46,9
Physical clay (below 0,01 mm)	%	46,6	48,6	48,6	55,2	61,3	59,5	59,3	57,9
TEXT		TT	TT	TT	TT	AL	AL	AL	AL
Specific gravity (Ds)	g/cm^3	2,68	2,68	2,72	2,72				
Apparent density (Da)	g/cm^3	1,20	1,50	1,66	1,68				
Total porosity (PT)	%	55,22	44,03	38,97	38,24				
Aeration porosity (PA)	%	28	13	4	3				
Degree of engraving (GT)	%	-9	13	23	27				
Hygroscopicity coefficient(CH)	%	8	8	8	10				
Coefficient of opacity (CO)	%	12	12	12	15				
Field capacity (CC)	%	23	21	21	21				
Total capacity (TC)	%	46	29	23	23				
Usable water capacity (CU)	%	11	9	9	6				
Hydraulic conductivity (K)	mm/h	5,5	1,0	0,54	0,33				
pH in water		5,56	5,68	5,64	5,78	6,16	7,30	8,11	8,00
Carbonates ($CaCO_3$)	%						0,21	1,26	0,42
Humus	%	3,73	2,76	0,87	0,31				
Nitrogen index (IN)		2,4	1,7	0,6	0,2				
Humus reserve	t/ha	17,90	53,82	30,33	6,25	**108,3**			
Mobile phosphorus (P mobile)	ppm	12,83	9,67	3,54					
Mobile potassium (mobile K)	ppm	81,0	52,0	45,0					
Swap Bases (SB)	me/100	13,81	11,90	10,63	14,02	19,31			
Exchangeable hydrogen (SH)	me/100	7,83	6,98	5,98	6,14	3,92			
Cation exchange cap (T)	me/100	21,64	18,88	16,61	20,16	23,23			
Degree of saturation in bases (V)	%	63,81	63,03	63,99	69,54	83,12			

Eutric cambisoils are soils in which the ochric (Ao) or molic (Am) A horizon is followed by the cambic (Bv) B horizon with values and chroma above 3.5% and eutric properties. No Cca horizon in the first 75 cm (SRTS-2012). The pedogenesis of these soils is characterized by a certain development of structure or colour, indicating a moderate alteration and development of morphological characteristics, the main feature being the presence of an in situ alteration horizon "Bv" (cambic B). In the upper part biogenic neoformations can be found and weak staining of iron oxides and hydroxides hydrated or in different degrees of hydration, depending on the degree of stagnation or glaciation, can be found in the horizon.

The main physical and chemical properties of the Eutricambosols in the depositional area are strongly influenced by the nature of the parent material and the pedophreatic water level between 1-2 m, (tab. 2- OSPA Timisoara archive).

Table 2

Main physico-mechanical, hydro-physical and chemical characteristics of the Eutric cambisoil from Ghizela, Timiș County

Horizons	UM	Aț	Aog_2	$ABvg_3$	Bzg_4	$BzCg_5$	Cn g_{16}	Cn g_{26}	Cn g_{36}	Cn g_{46}
Depth	cm	0-8	-26	-50	-75	-90	-110	-130	-150	-180
Coarse sand (2.0 - 0.2 mm)	%	0,4	0,5	0,8	1,4	1,7	2,1	2,3	2,9	2,8
Fine sand (0,2 -0,02 mm)	%	21,7	14,9	17,3	20,1	19,9	22,8	23,1	21,9	29,3
Dust (0,02 - 0,002 mm)	%	29,1	30,1	31,6	27,6	28,2	27,5	27,8	28,2	26,4
Colloidal clay (≤0,002 mm)	%	48,8	54,5	50,3	50,9	50,2	47,6	46,8	47,0	41,5
Physical clay (≤ 0,01 mm)	%	66,4	73,9	69,6	67,2	67,3	63,6	62,1	61,7	54,6
TEXT		AL	AL	AL	AL	AL	AL	AL	AL	TT
Specific gravity (Ds)	g/cm^3	2,68	2,68	2,70	2,72					
Apparent density (Yes)	g/cm^3	1,35	1,43	1,56	1,50					
Total porosity (PT)	%	49,63	46,64	42,22	44,85					
Aeration porosity (PA)	%	19	15	11	13					
Degree of engraving (GT)	%	6	13	21	16					
Hygroscopicity coefficient	%	11	13	12	12					
Coefficient of opacity (CO)	%	17	19	18	18					
Field capacity (CC)	%	23	22	20	21					
Total capacity (TC)	%	37	33	27	30					
Usable water capacity (CU)	%	6	3	2	3					
Hydraulic conductivity(K)	mm/h	1,4	0,8	0,26	0,52					
pH in water		6,16	6,30	6,42	6,49	6,47	6,78	6,86	6,94	7,00
Humus	%	3,89	2,83	1,07						
Nitrogen index (IN)		3,1	2,2	0,9						
Humus reserve	t/ha	42,01	72,84	40,06			155			
Mobile phosphorus (P mobile)	ppm	17,77	9,44							
Mobile potassium (mobile K)	ppm	210	123							
Swap Bases (SB)	me100	23,91	18,04	19,35	20,22	18,91	16,96	17,17	17,83	
Exchangeable hydrogen (SH)	me100	6,38	5,19	4,59	3,89	3,89	3,24	2,70	2,38	
Capaci. cation exchange capacity	me100	30,29	23,23	23,94	24,11	22,80	20,20	19,87	20,21	
Degree of saturation bases (V)	%	78,94	77,66	80,83	83,87	82,94	83,96	86,41	88,22	

Pelic Soils are clayey soils (frequently >45%, but can also have >33%) with *shrink-swell (z)* properties from the surface (or below 25 cm when worked) and may even have a vertical horizon in the first 100cm.The colour is different from *vertosols with values >3*.5 and

chroma >2 (lighter). Formed under vertosol-like conditions, but where pedogenesis processes are favoured giving rise to the pelic horizon (z), which is also an association horizon (Az, Bz, Cz) clayey, generally with >45% predominantly unsmectitic clay, to which the following characters are associated: dense clay packing and large polyhedral structure in the wet state, forming prismatic or polyhedral structural aggregates, very large in the dry state, wide and deep cracks and oblique faces that do not have the typical vertosols dip, minimum thickness 50 cm(SRTS-2012).

The main physical and chemical properties of the Pelosols in the warehouse area are strongly influenced by the nature of the parent material and the pedophreatic water level between 1-2 m, (tab. 3- OSPA archive Timisoara).

Table 3

Main physico-mechanical, hydro-physical and chemical characteristics of the Pelosoil from Ghizela, Timiș county

Horizons	UM	Aț	Azg_3	$AzyCng_4$	Cnz g_{15}	Cnz g_{25}	$Cnzg_6$	Cn g_{16}	Cn g_{26}
Depth	cm	0-8	-31	-52	-85	-107	-120	-140	-180
Coarse sand (2.0 - 0.2 mm)	%	1,4	2,6	3,0	2,3	2,2	2,6	2,1	1,9
Fine sand (0,2 -0,02 mm)	%	19,4	18,2	20,4	23,5	20,3	25,2	25,1	26,8
Dust (0,02 - 0,002 mm)	%	27,4	27,1	25,2	24,5	24,9	22,1	28,5	23,1
Colloidal clay (below 0,002 mm	%	51,8	52,1	51,4	49,7	52,6	50,1	44,3	48,2
Physical clay (under 0,01 mm)	%	68,8	67,2	65,1	58,5	64,8	60,5	58,4	59,1
TEXT		AL	AL	AL	At	AL	AL	TT	AL
Specific gravity(Ds)	g/cm^3	2,68	2,68	2,70	2,72				
Apparent density (Da)	g/cm^3	0,95	1,56	1,74	1,63				
Total porosity (PT)	%	64,55	41,79	35,56	40,07				
Aeration porosity (PA)	%	38	9	-1	6				
Degree of engraving (GT)	%	-21	22	33	25				
Hygroscopicity coefficient(CH)	%	12	12	12	12				
Coefficient of opacity (CO)	%	18	18	18	18				
Field capacity (CC)	%	28	21	21	21				
Total capacity (TC)	%	68	27	20	25				
Usable water capacity (CU)	%	10	3	3	3				
Hydraulic conductivity(K)	mm/h	11	0,26	0,26	0,26				
pH in water		5,15	5,60	6,13	6,40	6,71	7,35	7,86	7,98
Carbonates ($CaCO_3$)	%							0,41	0,42
Humus	%	3,96	2,51	1,25					
Nitrogen index (IN)		2,7	1,9	1,0					
Humus reserve	t/ha	30,10	90,06	41,33					
Mobile phosphorus (P mobile)	ppm	9,50	5,37	2,92					
Mobile potassium (mobile K)	ppm	161	84	58					
Swap Bases (SB)	me100	19,31	19,31	16,13	19,10	20,37			
Exchangeable hydrogen (SH)	me100	9,57	5,87	5,13	3,02	1,90			
Cation exchange cap (T)	me100	28,88	25,18	21,26	22,12	22,27			
Degree of saturation in bases (V)	%	66,86	76,68	75,87	86,34	91,46			

Technological processes (execution steps and possible pressures on environmental components)

The facilities at the Ghizela site receive all separately collected recyclable waste from the county, except those collected in Zone 1 Timisoara, which are sorted at the RETIM sorting

station. Waste from parks and gardens in Zone 4 Făget and Zone 0 Ghizela is also composted in the composting plant at the Ghizela site.

The main construction data of the landfill are:

- Total fenced area: 59,80 ha;
- Total usable landfill area (five landfill cells): 35.14 ha;
- Total landfill capacity (five landfill cells): 5,131,300 cubic metres;
- Surface area of storage cell 1: 7.01 ha;
- Capacity of storage cell no. 1: 623,000 m^3;

Total service life 41 years (5-9-9-9-9 years)

Technical area, technological areas, internal service roads, external slopes of storage cells, grassed areas and vegetation: 23.76 ha.

The landfill consists of six main areas as follows:

- the technical area, which includes:
  - entrance/exit weighing area for trucks, including the booth of supervisory staff;
  - area for receiving, sorting and dispatching recyclable waste (B, C, D);
  - residual waste reception and sorting area (E, F);
  - green waste composting area (A);
  - biostabilisation area for biodegradable waste;
  - technological water household, comprising:
- water supply borehole;
- storage tank;
- pumping station.

technological water supply network - biostabilisation area;

- sewage leachate - biostabilisation area;
- truck traffic zone;
- truck washing areas;
- administrative building, including laboratory and meteorological station;
- personal parking
- fuel station area;
- intervention area machinery;
- indoor/outdoor sewerage and contaminated water pumping from areas (A, B, C, D, E and F);
- transformation station;
- electricity generator;
- water household, comprising:

- water supply borehole;
- treatment, chlorination and pumping station;
- storage tank.

- wastewater treatment plant from the administrative building and from Ghizela and Sanoviţa;
- mobile ecological toilets.

- waste storage area;
- the leachate retention area from the storage area, comprising:
  - leachate collection and transport network;
  - retention basin and leachate pumping;

 leachate treatment plant;
 concentrated temporary storage tank.

- storm water retention area from the future storage cells for the waste and service roads (storage cells 2 - 5), including the pipeline gravity discharge;
- the retention area for rainwater from the technical area;
- area of the conventional clean water pumping station in the Timiș River;
- the pumped rainwater flow measurement area;
- the area of expansion of the capacity for mechanical-biological treatment of biodegradable waste.

At the same time, inside the technical area of the central warehouse, a waste glass storage area, with an area of 840 square metres, having on three sides panels of concrete with a height of 2 m and an area for the disposal of hazardous waste and WEEE.

Taking into account the geometric, geotechnical and hydrogeological characteristics of the site and the volume of soil required to build the perimeter dykes, the following solution was adopted of the warehouse in the filling.

The repository will consist of five storage cells with an estimated maximum operating life of 41 years.

The cells will be separated from each other by internal dikes of approx. 3,70 m high, in the first phase only cell no. 1 will be built, with an area of 7,01 ha. Its capacity of 623,000 cubic metres will be used in the initial operating phase for waste storage.

The landfill area will be surrounded by an embankment approx. 3,78 m.

The construction of the embankment will include earthworks on the existing ground, filling of the embankment body, landscaping of the upper part and grassing of the outer slopes of the embankment.

The dam will also be built in stages, so that in the first phase only the part related to the waste cell in operation will be built.

For monitoring groundwater quality (first groundwater layer), three monitoring boreholes, such as:

- a borehole located upstream of the groundwater flow direction, i.e. in the N,NE area of the landfill;
- two boreholes located downstream of the groundwater flow direction, i.e. in the S,SV area of the landfill.

Through these monitoring boreholes it will be possible to take water samples to determine the main indicators of groundwater quality.

To monitor the environmental parameters in the landfill area, a meteorological station will be installed in the administrative pavilion, which will have the following technical and functional parameters:

- measurement of temperature, humidity, wind (average, maximum, minimum values);
- Recording of measured parameters for a minimum period of 1 year;
- digital interface;
- high precision measurement sensors.

For the protection of biodiversity in the Ghizela non-hazardous waste landfill area the following elements are foreseen:

- 15 m wide vegetation hedge, located in the northern and western part of the site;
- 36 m wide vegetation hedge located in the southern and eastern part of the site.

The 15 m wide plant hedge will be made of 7 rows of saplings as follows:

- 2 rows of oak;
- 1 row of linden trees;
- 2 rows of acacia;
- 2 rows of shrubs (1 hornbeam and 1 maple).

The 36 m wideplant hedge will be made of 15 rows of saplings as follows:

- 3 rows of oak;
- 3 rows of linden trees;
- 5 rows of acacia;
- 4 rows of shrubs (2 hornbeam and 2 maple).

The density of seedlings will be 5,000 pieces/hectare and the area of the plant canopy approx. 6,85 ha.

All free areas, except for the area of the future storage cells No II, III, IV and V, will be weeding to restore the original appearance of the area, the area to be weeded is approx. 3,30 ha.

The outer area of the slopes making up storage cell No. 1 will be grassed to prevent erosion due to rainwater and to achieve a look in keeping with the rest of the enclosure, the area of the outer slopes to be grassed is approx. 1 ha.

CONCLUSIONS

Romania's accession to the European Union has brought into the limelight the importance of environmental protection and compliance with European waste management legislation. In this context, and given the need for measures to solve the problem of non-hazardous waste disposal in environmentally friendly conditions, Timis County Council initiated the project "Integrated waste management system in Timis County", co-financed by European funds, with a view to the proper management of all categories of waste from the population, economic agents and public institutions, each of the areas being assigned a waste transfer center, railway station, respectively the ecological landfill of non-hazardous waste.

The project is expected to last 50 years, including construction, operation and final closure of the repository. The construction of the repository will involve three phases, which will not be than parţial distinct.

The final closure phase will be distinct only after the storage capacity of the repository is exhausted and will include only the final closure of the last cell.

Since construction and closure work mainly involves the handling of soil, these situations will be associated with the highest emission rates for particulates and pollutants resulting from the operation of machinery.

Also, taking into account the physical-geographical and social-economic characteristics of the collection areas, the needs and ways to develop the infrastructure and the necessary services have been analysed in order to comply with the legal requirements and to be in line with the evolution of the quantities and nature of waste generated in the Timis County, both in urban and rural areas.

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