

**ANNEX IV**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

For the project

**INTEGRATED WASTE MANAGEMENT SYSTEM IN  
COVASNA COUNTY**

*Non technical summary*

June 2010

# **Integrated Waste Management System in Covasna County**

## **Environmental Impact Assessment**

### **Non-technical summary**

#### **1. ACTIVITY DESCRIPTION**

Waste generated in urban and rural localities is landfilled in the nearest illegal dumps. The illegal activities of waste disposal, spread all over the county, do not comply with environmental policy (there is no bottom sealing, leachate or biogas collection, wastewater treatment or monitoring equipment). These landfills are pollution sources with high risks for human health and environmental factors. The biogas generated pollutes the air and due to its' explosive characteristics represents a risk for human health. Spreading the untreated waste in uncontrolled dumpsites requires larger surfaces for land filling and higher expenses for monitoring.

The proposed Project consists of the necessary measures to be implemented for solving the problems related to the existing waste management system in Covasna County.

Street cleaning is already being carried out under existing municipal programs and does not form part of the project.

The proposed waste management system refers to municipal solid waste, such as household waste, street waste, waste from parks and gardens, market waste and household type of waste from commercial, industrial and institutional activities.

#### **PROJECT OBJECTIVES**

Implementation of an integrated waste management system in the county of Covasna is in line with EU legislation, the National and Regional Waste Management Plan (RWMP) the Masterplan for Waste Management for Covasna County and is based on the objectives of the SOP, namely:

- To comply with the EU Landfill Directive with respect to biodegradable waste
- To safeguarding public health and to protect the environment by improving the waste collection and depositing and by providing for closure and remediation of the existing dumpsites and construction of a new landfill to EU standards
- To optimise the integrated waste management and to improve service standards
- To introduce and expand systems of segregated waste collection to promote the recycling of packaging and bio-waste in accordance with the national and EU requirements and reducing the proportion of waste for landfill

The project will also :

- strengthen the technical and managerial capacity in Covasna County in the implementation and operation of a regional solid waste management system;
- support the local authorities in developing and realising an efficient strategy with regard to tariffs, billing and bill collection;

- raise awareness among the inhabitants of the benefits resulting from the project, segregated waste collection and recycling of waste.

## **WASTE GENERATION, COLLECTION AND DIVERSION TARGETS**

Based on the RWMP – Region 7 Center, in Covasna County approximately 80,000 ton of waste is generated every year and currently there is population coverage with collection service of approximately 100%. In order to meet the objectives mentioned above, the proposed measures under this project are intended to achieve the following targets:

- increase the connection rate to public sanitation services of adequate quality and at affordable tariffs;
- reduce the quantity of waste deposited in the landfills;
- increase the quantity of recycled and reused waste;
- reduce the number of old ecological burdens, and;
- Improve technological standards of disposal.

The project aims at diverting about 35% of the waste from landfill disposal, reducing the volume for disposal to about 50,000 ton of mixed waste per year in 2012.

## **INDICATORS**

A list of physical indicators for project implementation will be used to monitor physical progress of the construction of the project. A final list of physical indicators will be established for monitoring purposes once design of the various components has been established.

In addition it is proposed to develop a list of performance indicators for monitoring the eventual results of the project, including the following:

<b>Indicator</b>	<b>Unit</b>	<b>Before the project</b>	<b>After the project</b>
Collection coverage urban areas	% inhabitants	100%	100%
Collection coverage rural areas	% inhabitants	100%	100%
Separate collection system of packaging and biodegradable waste in place	Yes/no	No	Yes
Volume of mixed waste diverted from the landfill	% tons	0%	31%
Total disposed mixed waste at ecological landfill in Borosneu Mare	Ton/year -2012	0	53,448
Total separate collected organic waste	Ton/year-2012	0	3,932
Total separate collected packaging waste	Ton/year-2012	0	6,557

## **PROJECT DESCRIPTION**

The components of IWMS are:

- Component 1 – Waste transport and transfer from TS to IWMC
- Component 2 - Integrated waste management centre and one county landfill
- Component 3 - Closure of 4 non-compliant urban landfills
- Component 4 - Public awareness, Technical Assistance and Supervision

### **Component 1: Waste transport and transfer from TS to IWMC**

Having in view the existing situation of collection system in Covasna County, with a 100% collection coverage of urban and rural areas and the Beneficiary requirement of keeping the existing collection operators when the new IWMS will become operational, it was decided that the collection and transport components will be in charge of existing collection operators.

The choice of collection system type (bring system, door to door system or mixed system), the type of collection equipment (containers and collection/transport vehicles) will be the responsibility of the existing Collection Operators.

In this regard, it is necessary that the existing contracts for operation to be amended with the following provisions when the future IWMS will be in place:

- a) To meet collection targets for which IWMS was designed;
- b) Collection operators are required to invest as much as necessary to achieve collection targets stipulated;
- c) Operators are required to transport collected waste to the proposed transfer Stations or IWMC (Integrated Waste Management Centre) in Borosneu locality, as soon as these facilities become operational;
- d) The operators who perform waste collection services in urban areas are required to build and equip one bring centre in each urban locality for bulky waste, WEE and domestic hazardous waste. They should make contracts with producers associations in order to treat these types of waste, treatment being producers` responsibility.

Collection targets to be complied:

Specific measures are foreseen for the different waste streams as described below:

- For mixed waste, the existing collection operators will provide the necessary equipment for the introduction of a county-wide collection system aiming at 100% coverage in urban and 100% coverage in rural areas.
- For biodegradable waste, the existing collection operators will provide for separate collection systems to be introduced in urban areas covering 30% of urban population in 2012, 60% in 2015 and 80% in 2017, whereas in rural areas home composting will be stimulated covering 100% of rural population. Targets are to reduce the quantity of biodegradable waste that is landfilled related to the reference year 1995 (49,406 tons) with 25% in 2010, with 50% in 2013 and with 65% by 2016.

- For packaging waste<sup>1</sup> the existing collection operators will provide in urban areas waste containers for separate collection of paper, plastic, metal and glass. The separate collection for packaging waste is provided for 100% in urban area and the targets per type of waste are as follows:
  - 2008 (reference year) total recovery 40%, total recycling 33% with 32% glass, 60% paper and cardboard, 11% plastic, 50% metal and 7% wood
  - 2009: total recovery 45%, total recycling 38% with 38% glass, 60% paper and cardboard 12% plastic, 50% metal and 9% wood
  - 2010: total recovery 48%, total recycling 42% with 44% glass, 60% paper and cardboard, 14% plastic, 50% metal and 12% wood
  - 2011: total recovery 53%, total recycling 46% with 48% glass, 60% paper and cardboard, 16% plastic, 50% metal and 15% wood
  - 2012: total recovery 57%, total recycling 50% with 54% glass, 60% paper and cardboard, 18% plastic, 50% metal and 15% wood
  - 2013: total recovery 60%, total recycling 55% with 60% glass, 60% paper and cardboard, 22.5% plastic, 50% metal and 15% wood.

All mixed waste will be directly transported to the IWMC in Borosneu Mare.

Two options have been analyzed:

1. construction of transfer stations near the major towns (where the main waste quantity is generated)
2. direct transport of collected waste to the sanitary landfill of Borosneu Mare IWMC.

Based on a comparison between the additional costs of constructing a transfer station and the cost savings on transport by larger trucks, one transfer station is required for Covasna County. Collected waste will be transferred to transfer stations in Targu Secuiesc.

Trucks for collection of waste will be provided through contracts with operators and are not financed by the project. Transfer station will be located along paved roads to ensure easy access by trucks. The transfer station consist of a ramp and elevated disposal area and containers with a volume of 32 m3 are placed next to this area in which the waste is disposed. An open top container system is proposed because the system with press containers requires a higher transport volume to be more cost efficient than open top containers.

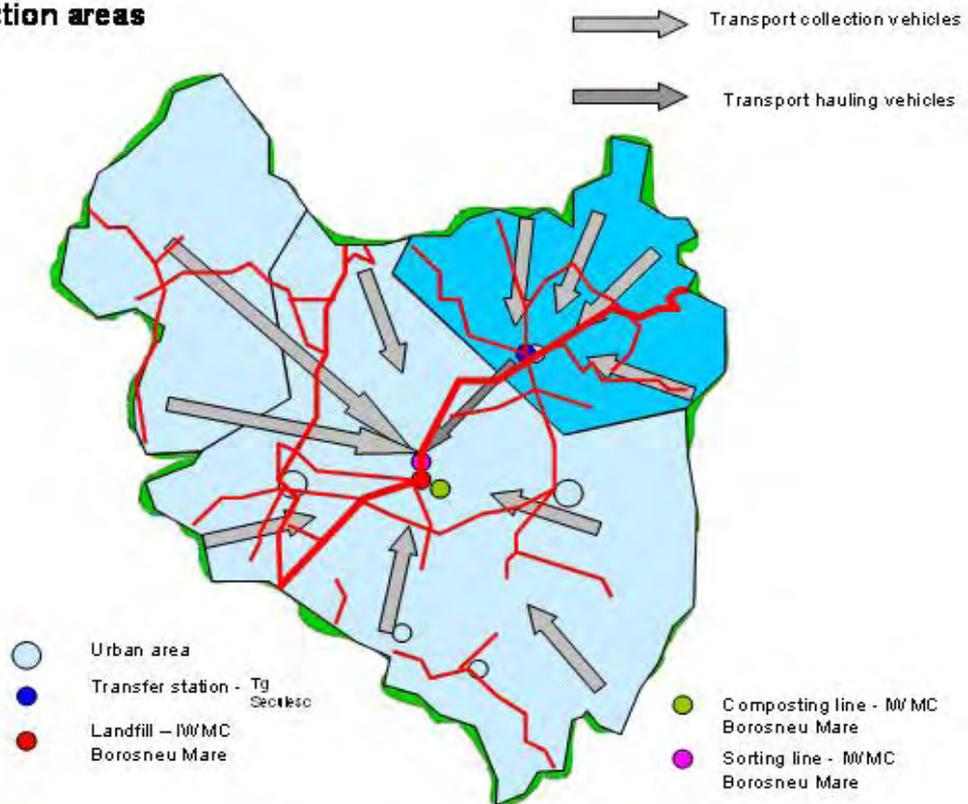
The waste collection areas are indicated in the map below:

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<sup>1</sup> According with the tender documents, the operation contract for the future IWMC operator will foresee the obligation of identifying the market opportunities for the valorisation of recycled materials. Nowadays there are several local companies undertaking recycling activities. However it's hard to estimate the market for the coming years given the actual global crisis.

The list of authorised economic agents for the collection, valorisation or elimination of recyclable waste in Covasna County is enclosed in Annex XVI of Application Form.

## Waste collection areas



## Component 2: Integrated Waste Management Centre

The project will provide for an Integrated Waste Management Center in Borosneu Mare locality, that will include a landfill, a composting plant and a sorting line with the following characteristics:

	Designed capacity
Composting plant	12,000 tons/ year
Sorting line	11,000 tons/ year
Landfill	0,93 mil m <sup>3</sup>

The Borosneu Mare site has a size of 15.7 hectares, is located in a relatively remote location and has the opportunity to develop other facilities near the landfill site. The total storage capacity of the Borosneu Mare landfill is 0.93 million m<sup>3</sup> and the lifetime is estimated to be 21 years.

The landfill will be constructed with 3 cells. The first cell is approximately 4.4 ha (sufficient for 8.8 years operation) and the costs are part of the project. The other two cells, that are not included in the investments for this project, will be approximately 4.4 ha together (sufficient for 6.3 years and 5.3 years respectively) and are planned for 2020, and 2026 respectively. In the design the closure is also taken into account. Besides storage, the landfill also includes a stormwater drainage management system,

leachate treatment and a gas collection and flaring system. In addition to this there will also be an administrative building, weighbridge plus weighbridge house, parking area and related facilities.

The **sorting line** enables sorting of various types of packaging waste to achieve a better quality of the separated components and hence increased market potential. Furthermore the sorting line will contribute to achieving the recycling targets for Romania.

The **composting plant** with a capacity of 12,000 tons/year consists of a reception area, composting area, maturing area and a storage area. In total approximately 1.6 ha is required. The proposed technology is windrow composting.

### **Component 3: Closure of existing urban landfills**

In the area of Covasna five major dumpsites have been identified: Baraolt, Intorsura Buzaului, Targu Secuiesc, Sfantu Gheorghe, Covasna.

Only four of these five urban landfill sites will be closed and capped after the new site in Borosneu Mare is opened, because Baraolt Local Council did not join IDA and is nor part of this project. When the new landfill opens, the generated waste will be transported to the new landfill site.

### **Component 4: Public awareness, Technical Assistance and Supervision**

The project will also support the Local Authorities in the fields of public awareness, Technical Assistance for Management of Project Implementation, assistance for arranging contracts with operators, for Supervision for works and supply contracts.

Component 4 include the following activities:

1. Public Awareness: Significant efforts are needed for raising the level of public awareness for waste-related and environmental issues. Key issues include the need for reduction of waste at source, source separation of recyclable materials from the general waste stream and payment of charges/user fees to sustain County wide collection, treatment and disposal services. A budget for public awareness is included in the annual cost estimates for the project.
2. Technical Assistance: Technical assistance is foreseen under the project for management assistance to the PIU in the management of project implementation and preparation of tender documents and contracts with various operators And in the preparation and execution of public awareness activities.
3. Supervision: Assistance is foreseen to be financed under the project for supervision of the various works and supply contracts in accordance with the implementation plan.

## **2. METHODOLOGY OF ENVIRONMENTAL IMPACT ASSESSMENT**

The identification of environmental pollution sources is based on the feasibility study and existing environmental conditions, as observed during the field visits.

The environmental impact of the IWMS (Integrated Waste Management System) during the construction and operation periods has been evaluated in accordance with the provisions of European and Romanian legislation (CD 85/337/CEE regarding the

environmental impact of major public and private projects modified and completed by CD 97/11/EC).

For each major environmental problem the necessary measures for the prevention, reduction or elimination of negative impacts have been identified. The positive impact of each proposed activity has also been underlined.

The potential impact assessment is based on the proposed conditions and general characteristics of this development project. The environmental impact is quantified as Zero, Insignificant, Moderate, and Significant.

Zero	Absence of any form of reduced impact
Insignificant	Possible, produced at low level for a very short period.
Moderate	The impact can determine a negative or positive modification of existing environmental conditions or can have effects on human health.
Significant	It is estimated that the impact can have significant effects on environment or human health, on a large scale or long period.

The project does not produce an impact outside the borders.

There are no significant uncertainties about the project or project impact on environment.

### 3. ENVIRONMENTAL IMPACT ASSESSMENT

#### 3.1. Impact during the construction period (short term impacts)

The IWMC construction, with the activities mentioned above, will be in accordance with Romanian and international standards, which includes public consultation of residents, ensuring adequate temporary and safety roads for residents and constructors. The construction permit will be obtained for each proposed site. The duration of the construction period of the proposed project is 12 months. The most sensitive potential receptors will be affected only in a localized sense during the period in which works are developed.

A summary of the activities and associated impacts, which are estimated during the construction phase, is presented in Table 3.1.

*Table 3.1 Summary of impact during construction period*

Impact	IWMC construction
Noise	•
Dust	•
Odours	
Wastewater pollution	
Soil losses	•
Traffic disturbance	
Utilities services disturbance	
Access disturbance	•
Cultural resources disturbance	

Impact	IWMC construction
Roads disturbance	
Visual impacts	•
Security, health and safety	•
Animal or vegetation disturbance	
Pathogens dispersion	
pollution due to wastewater and waste spreading on streets	

These impacts during the construction activities are temporary and insignificant.

### 3.2. Impacts during the operation period (long term impacts)

The impacts on the environment will be generated by the following operational activities:

- The operation and maintenance of the composting and sorting plants.
- The operation of new ecological landfill.

The main results of the waste treatment in composting and sorting plants are compost and recyclable materials – iron, non ferrous materials, paper, glass, plastic, unrecyclable materials.

The treatment of solid waste and their elimination process may be a serious source of odors. The activities considered without impact are not mentioned.

*Table 3.2. Summary of the impact during the construction and operational phases*

Identification of the impact and of the positive effects on the environment	IWMC construction
Environment plans and policy	+
Compatibility with the sectoral programs	+
Land use	+
Human population	-
Visual aspect	-
Public hygiene	+
Health and occupational safety	+
Socio-economy	+
Natural resources	-
Soils	-
Ground water	NA
Surface water	NA
Air quality	+
Flora and fauna	+
Cultural inheritance	NA
Historical monuments	NA
Material assets	NA
Roads	+

Legend: + positive effects; - negative effects; NA = non-applicable

The environment and the public hygiene will be improved by implementing a new integrated waste management system, which includes IWMC in Borosneu Mare locality.

The health and the occupational safety of workers will be improved, especially by providing safety equipment.

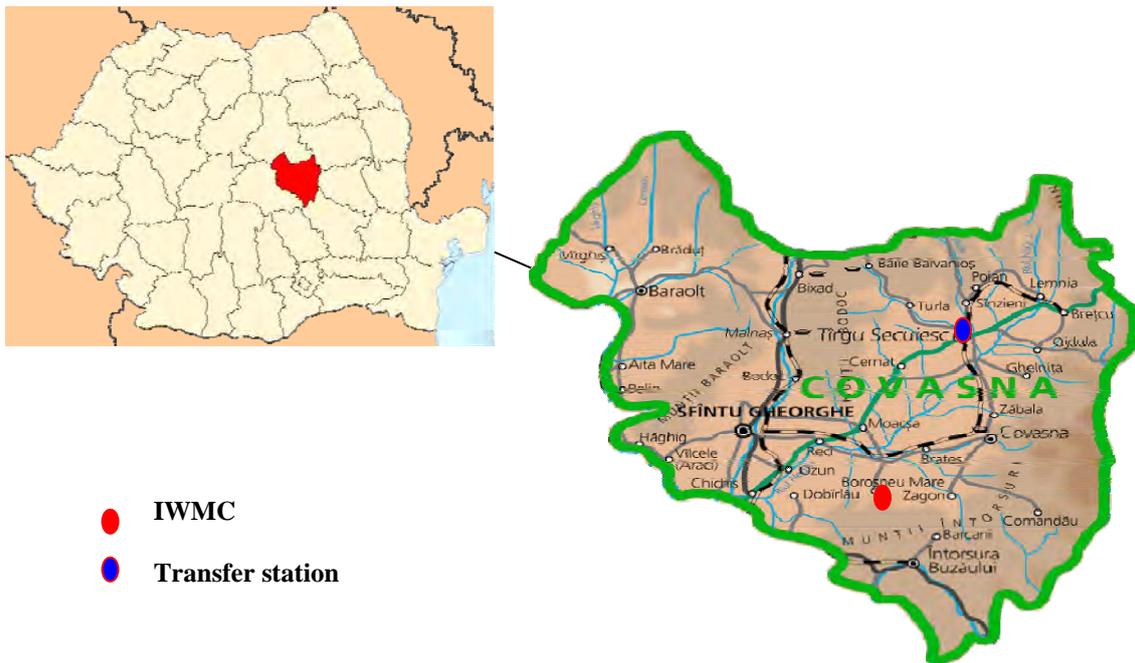
Waste scavenging will be prevented by the new waste management system. Due to this fact, a number of people will lose their jobs. However, the unacceptable and unhygienic conditions in which the waste scavenging takes place today will end. This will increase the positive effect of public hygiene in general and will create new jobs.

The rehabilitation program of existing landfills and dumpsites will have a positive effect upon the soil and water quality.

The waste management program is evaluated as neutral with regard to the aspect of cultural inheritance.

#### 4. IDENTIFICATION AND DESCRIPTION OF IMPACT AREA

Covasna County is situated in the Carpathians arch, with a central position towards the country's boundaries and capital city at Sfantu- Gheorghe.



#### CMID:

The project will provide for an Integrated Waste Management Center in Borosneu Mare locality, that will include a landfill, a composting plant and a sorting line. The Borosneu Mare site has a size of 15.7 hectares, is located in a relatively remote location and has the opportunity to develop other facilities near the landfill site.

### **Transfer station:**

One transfer station is required for Covasna County in Targu Secuiesc. The impact although insignificant is limited within the transfer station site (0,3 ha), situated outside the living area.

### **Closure of urban landfills:**

In the area of Covasna five major dumpsites have been identified: Baraolt, Intorsura Buzaului, Targu Secuiesc, Sfantu Gheorghe, Covasna.

Only four of these five urban landfill sites will be closed and capped after the new site in Borosneu Mare is opened, because Baraolt Local Council did not join IDA and is not part of this project. When the new landfill opens, the generated waste will be transported to the new landfill site.

The impact of existing landfills closure will be a positive one by improvement of environmental factors conditions within the site and the neighbour.

## **5. MITIGATION MEASURES**

### **5.1. WATER**

- **Mitigation measures during the construction works**

#### **General mitigation measures for IWMC, transfer station and closure of existing landfills**

In the construction period, contractual obligations are foreseen with regard to water protection measures:

- A special deposit for technological waste;
- A deposit for the materials used in constructions;
- Ecological toilets for the involved personnel in the construction works of IWMC;
- Water supply for construction personnel will be delivered by special economic agents;
- Domestic wastewater generated from workers at the site during construction phases will be handled and disposed in an environmentally safe manner. It can be collected in closed tanks and handled to the nearest domestic wastewater treatment plant.
- Washing equipment for the vehicle tires at the IWMC;
- Warning messages in all the potential dangerous places for human health and environment.
- Adequate means for the prevention of spreading of material (soil, clay, waste or construction materials) on public roads/areas or other places with risk to human health or the environment by using covers of transport vehicles.
- During construction phase, the solid waste generated from human activities and consumable parts should be collected in closed bins and disposed at nearest dumping site.
- Measures for protection from fire during construction, including a contract with local fire district.

- Adopt and obtain approval for a Traffic Management Plan from local authorities prior to construction, provide a notice to landowners in the area, provide road signage, encourage car pooling, provide flaggers and provide detour plans.

**Particular mitigation measures for sanitary landfill within IWMC**

- Landfill bottom liner system composed of:
  - o 0.5m compacted clay layer
  - o 2mm thick HDPE liner
  - o Leachate drainage and collection system
    - 0.5m gravel drainage layer
    - HDPE leachate drainage pipes
    - HDPE leachate transport pipes
    - HDPE manholes
    - Waterproofed leachate storage basin
    - Leachate treatment plant
- Waterproofed treated water basin
- Evaporation pond for excess water
- Preventing uncontrolled water discharge using overflow valves
- Water well constructed in accordance with specific norms using PVC pipes with insulated joints and proper marking of well's sanitary restriction area.
- Construction of 3 groundwater monitoring wells
- Groundwater monitoring system
- Storm water collection and conveyance structures construction including channels and culverts, stilling basins. These are designed to function effectively under the range of anticipated rainfall events including those considered to be "worst case scenario".
- Storm water detention/sediment basin will be utilized for treatment and batch discharging runoff prior to its reuse or evaporate.
- The quality of the surface water runoff will be controlled through methods of landfill construction that will prevent runoff from areas where waste is disposed (specially landfill dikes)
- All activity areas will be constructed from concrete with surrounded by runoff collection ditches (parking lot, composting plant, reception area, access roads, sorting line reception area, workshop)
- Oil separator
- Waste water sewage system
- Reuse of water within compound

- **Mitigation measures during operation period**

**IWMC**

- The waste oil produced from vehicles and machines during operation phases will be collected in containers and sent to the petroleum refinery company
- Domestic wastewater generated from workers at the site during operation phases will be handled and disposed in an environmentally safe manner. It will be collected and treated in the Leachate treatment plant.
- The IWMC site is not connected to any natural water source; the wastewater is treated in WWTP.
- The treatment unit of leachate is designed in a way that allows routine inspection responding to cases of emergency leakage due to cracks.
- Periodical inspections of leachate system.
- Groundwater will be monitored periodically by taking samples from monitored wells.
- The platforms have to be maintained clean in order to control the quality of rainwater.
- Daily cleaning of the platform will be made using a sweeper vehicle with a vacuum cleaner and water (similar water used in street cleaning).
- Maintenance of leachate and rainwater collection system
- Vehicle wheel washing system at landfill exit
- The Project will comply with all surface water quality discharge limits; moreover the landfill is not located within the zone of influence of any public water supply wells that could affect the underground water quality.
- Leachate quality and quantity measurements to monitor for any developing problems with the liner containment system, allowing for implementation of a corrective measure prior to adverse groundwater impact.

**Mitigation measures after sanitary landfill closure:**

- Waterproof capping system
- Periodical inspections of capping system.
- Monitoring of groundwater quality

**Mitigation measures for transfer station during operation**

- The platform has to be maintained clean;
- For waste storage sliding top containers will be used in order to avoid waste contact with rainwater.
- Ecological toilets are foreseen for the operational personnel.

**Particular mitigation measures for closure of existing landfills**

- Periodical inspections of capping system.
- Periodical inspections of biogas collection system.
- Monitoring of groundwater quality

## 5.2. AIR

- **Mitigation measures during the construction works**

### **IWMC, transfer station and closure of existing landfills**

- The dust generated during construction works of IWMC will be permanently controlled by vehicle cleaning and watering.
- The roads will be watered in dry weather periods.
- The transport vehicles will be covered during construction in order to avoid light material spreading.

- **Mitigation measures during operation period**

### **IWMC:**

The gas and odors emissions from the landfill can be reduced by biogas collection, periodical inspection and training of personnel.

The biogas management system will include a fixed measurement device of gas flow for production monitoring. Also a mobile device will be available for the temperature and gas composition measurement at gas wells.

The following measures are also proposed, besides biogas collection and management:

- Plantation of a green belt around the IMWC
- Keeping of buildings, platforms and containers in good functioning conditions by regularly cleaning ;
- Minimizing the size of operational area thereby reducing the potential for dust and odor in the air
- Application of daily, intermediate and final cover layer
- Limiting the idling of over the road vehicles that are staged on site
- Vehicle wheel washing system at landfill exit
- Paved entrance road maintenance
- Airborne litter will be controlled by minimizing the size of working face, sheltering disposal operations from prevailing winds, fencing the IWMC area
- Screening of incoming waste for excessive intense odors and limit the amount of odorous sludges witch are accepted at the facility
- Placement of additional and intermediate cover on areas known to release stronger odors
- Grass planting on unused areas and on the landfill dike's slopes
- New and modern vehicle usage equipped with air pollution prevention devices.
- Providing for sufficient flare engine capacity to combust all biogas witch can be collected

### **Mitigation measures after sanitary landfill closure:**

- Waterproof capping system
- Periodical inspections of capping system.
- Monitoring and maintenance of gas collection and flaring system

### **Mitigation measures for transfer station during operation**

- The platform has to be maintained clean;
- For waste storage sliding top containers will be used in order to avoid waste spreading in the air.
- Waste vehicles unloading route optimization
- Prevent simultaneous access of vehicles in the Transfer Station in order to limit the time spend for unloading operation
- Electrical heating system for personnel
- Regularly cleaning of Eco toilets

### **Particular mitigation measures for closure of existing landfills**

- Periodical inspections of capping system.
- Generated biogas will be dispersed in the earth capping layer (passive collection LFG system) through a bio bed.
- Periodical inspections of biogas collection system.

## **5.3. SOIL**

The mitigation measures for soil environmental factor are similar with the ones for Water environmental factor. Considering also that the potential pollution of underground water is having the same impact on soil, the proposed mitigation measures are the same.

The following additional measures are foreseen:

- **Mitigation measures during the operation period**

### **IWMC**

- Plantation of a green belt around the IMWC and fencing to prevent airborne litter to pollute the nearby area.
- Vehicle wheel washing system at landfill exit
- Periodic cleaning of paved areas by a street sweeper.
- Reuse of uncovered soil from construction period including separate storage of vegetal layer
- Soil erosion prevention by stabilizing soil surfaces and soil migration/losses due to erosive forces of storm water impact and runoff both during construction and operation.

### **Mitigation measures after sanitary landfill closure:**

- Respect the maximum landfill closure slopes in order to avoid capping layer erosion
- Planting grass on the final capping layer
- Monitoring and maintenance of the capping layer

### **Mitigation measures for transfer station during operation**

- The platform has to be maintained clean;
- For waste storage sliding top containers will be used in order to avoid waste spreading both in the storage and transport period.

### **Particular mitigation measures for closure of existing landfills**

- Periodical inspections of capping system.
- Identifying unused/low quality soil for capping system in the area
- Adequate measures to restore the soil borrow pits used for capping system

## **5.4. NOISE AND VIBRATION**

- **Mitigation measures during the construction period**

### **IWMC and closure of existing landfills:**

- Discomfort created by the waste transport vehicles will be reduced by optimizing routes and transport program.
- Use of equipment for construction works in accordance with legal requirements relating to noise
- Periodic inspection and verification of mechanical equipment

- **Mitigation measures during operation period**

### **IWMC:**

The IWMC is located at more than 1km distance from the inhabited area, which makes the noise impact to be insignificant.

The following measures were foreseen:

- Use of equipment in accordance with legal requirements relating to noise
- Periodic inspection and verification of mechanical equipment
- Traffic management plan
- Forbidding of sound signaling methods
- Installing and maintenance of sound dampers for fixed equipments like water booster, electrical engines
- Using adequate safety equipment for personnel
- Road pavement maintenance

- Limiting speeds of vehicles on-site
- Restrict heavy vehicles like compactor and frontloaded outside the landfill area

### **Mitigation measures for transfer station during operation**

- The platform has to be maintained in good shape;
- Usage of metal wheeled storage containers
- Optimizing unloading route

## **5.5. BIODIVERSITY**

There are no protected areas (Natura 2000 areas) at the proposed sites. The flora and fauna diversity is relatively poor.

The proposed mitigation measures for impact reduction on biodiversity are:

- **Mitigation measures during the construction period**

In order to avoid additional loss of biotopes, the construction area must be limited to the smallest area necessary for the works. Dumping and storage of the excessive soil and materials must be done inside the construction area. The vehicles must work only inside the construction area and must not exceed these limits. The biotope structures removed inside the construction areas must be restored after the works closure.

- **Mitigation measures during the operation period**

In order to reduce disturbance of wild life during the operation period, the proposed method is to work in the planned time without exceeding the emissions threshold. Periodic checks will be made.

In addition, in order to avoid accidents, traffic pointers will be installed with regard to animals.

## **5.6. LANDSCAPE**

- **Mitigation measures during the construction period**

The following measures that must be taken during the construction phase will be specified in the contracts with contractors and operators and will be monitored:

- The spreading of construction materials will be avoided;
- The extension of the work area will be avoided by boundary setting;
- The earthworks will be controlled in order to avoid the dust dispersal;
- The trucks that transport materials will be covered ;
- The area will be cleaned after completion of works and the surroundings will be brought back into the initial natural conditions.
- Monitoring of activities planning in order to avoid long periods of execution works

- **Mitigation measures during the operation period**

#### **IWMC:**

The management measures of the landscape in the IWMC area will be implemented after the closure of construction works.

- The slopes of the new ecological landfill will be covered with perennial grass.
- Also, a green belt will be planted around the waste management centre.
- The IWMC will be surrounded with wire mesh fence
- Provision of maintenance of green spaces
- The platforms and containers must be maintained in good conditions
- The colors and the materials will be chosen in order to be in harmony with the surroundings.
- Special uniforms will be provided for personnel to maintain professional standards and provide safety.

#### **Mitigation measures after sanitary landfill closure:**

- Planting grass on the final capping layer

#### **Mitigation measures for transfer station during operation**

- The platforms and containers must be maintained in good conditions
- The colors and the materials will be chosen in order to be in harmony with the surroundings.
- Special uniforms will be provided for personnel to maintain professional standards and provide safety.
- Grass seeding on unused areas

#### **Particular mitigation measures for closure of existing landfills**

- Landfill closure is a landscape mitigation measure by itself
- Grass seeding on top on the capping system

### **5.6. PUBLIC HEALTH AND OCUPATIONAL SAFETY**

- **Mitigation measures for public health:**

- Maintenance of the dust control during the construction activities and during the transport of the materials by watering them (when applicable).
- The correct manipulation of the solid waste during transport and disposal.
- The correct manipulation, by respecting the safety requirements, in collecting and disposing the solid waste, in order to prevent the appearance of odors.
- The strict control on animals and insects (diseases) such as dogs, cats, rats etc. by implementing a pest control plan.

- Temporary cover layer of the waste during operation in order to prevent odors.
  - Inhabitants are not allowed to enter in the solid waste landfill site, in order to prevent fire or waste spreading.
- **Mitigation Measures for health and occupational safety:**
    - Maintenance of the dust control during the construction activities and during the transport of materials.
    - The implementation of safety procedures and the provision of safety equipments for workers.
    - Informing and preparing the drivers and workers with regard to correct handling of waste and personal protection equipment.
    - The frequent clinical examination of the workers.
    - The instruction of the employees in identifying the hazardous waste and in applying the specific handling procedures.

## **6. FORECAST ON ECONOMIC AND SOCIAL CONDITIONS**

Due to lack on any identified significant adverse impacts, no mitigation measures are necessary.

During the operation period, the project will have a positive impact. By waste collection, transport, treatment and ecological landfilling a high level of sanitation will be assured in the county. A more efficient waste collection will be implemented, preventing leakage from waste containers. The closure of garbage storage points from blocks of flats will eliminate the smell problems inside buildings.

The target population to benefit from improved sanitation services once this project is implemented is the whole population of Covasna County, except Baraolt City<sup>2</sup>. Due to this project, an estimated number of 213,084 (year 2012) inhabitants, EU citizens, will have better living conditions benefiting of a new IWMS that's includes waste treatment and ecological disposal.

Also, the project will reduce and/or eliminate the environmental impact of uncontrolled waste disposal by closure of existing urban landfills that are not compliant with the legislation in force.

Health and working conditions of sanitation workers will be improved, mainly by delivering safety equipment and improved facilities in the IWMC. The closing of garbage storage points from blocks of flats will contribute to better working conditions for sanitation workers.

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<sup>2</sup>The IDA status allows the association of Baraolt Local Council in the future. The additional collected mixte waste from Braolt City will affect the future landfill lifetime by decreasing it with 1 year. The treatment capacities for composting and sorting are designed at the maximum quantities of selective collected waste in 2038, therefore there is capacity to treat also the waste selective collected from Baraolt city.

In addition to these benefits, as in any other major construction project, the project will have a positive impact due to increased local employment opportunities. The project will create new jobs in waste collection, treatment and ecological disposal and will increase the economic activities of the inhabitants in different sectors such as transport, commerce, maintenance – repairs etc.

As a positive effect of cleaning, tourism may increase in the whole county.

## **7. OPTION ANALYSIS**

### **7.1.Waste Collection and Transfer**

*This Project refers mainly to the necessary investments in the treatment and waste elimination components.* In this regard an Integrated Waste Management Center (IWMC) will be constructed.

### **7.2.IWMC:**

#### **Landfill Location**

The regional waste management plan (Official Monitor nr. 232 bis / 04.04.2007) states in “Chapter 7 Disposal” that in Covasna County 1 new landfill is foreseen.

Initially, under the *Technical assistance project for project preparation in waste sector - Romania Europeaid/119085/D/SV/R*” in Covasna and Harghita counties it was foreseen the implementation of a commune IWMS.

In July 2009, the Ministry of Environment decided that each county will be treated individually. Thus, the only available location proposed in Covasna county was proposed in Borosneu Mare. No other sites were proposed by the county, thus an option analysis couldn't be conducted.

The Borosneu Mare site was proposed for the construction of the future IWMC, with a size of approximately 15,7 hectares. After the analysis of field surveys, it was concluded that the site is proper for this purpose.

The landfill will receive inert and non-hazardous municipal solid waste. There is the probability that small amounts of household hazardous waste will also be received at the landfill.

#### **Landfill liner system:**

#### **Bottom liner options:**

- a) 1 m of clay layer + synthetic liner
- b) 0,5 m of clay layer+ synthetic liner

Alternative b) was chosen due to natural soil characteristics (clay).

#### **Sorting line:**

#### **Analysed alternatives:**

Alternative 1: manual handpicking.

Alternative 2: mechanical separation.

Alternative 1 was chosen.

### **Composting plant**

Therefore the following two alternatives are regarded.

Alternative 1: Windrow composting, piles are created of 2-3 meter height and frequently turned with a turning machine, the composting period is estimated at 3-6 months.

Alternative 2: Aerated static pile composting, piles are created and air is blown into the pile. The air is not treated. The composting time is estimated to be 2-3 months.

Alternative 1 was chosen. From a cost point of view (limited to process cost) the windrow composting plant has the lowest costs. From an environmental point of view however this process has the potential to release odours.

### **7.3. Transfer station**

As for the transfer station location, 2 sites were analyzed in Baraolt and Targu Secuiesc localities. After the Baraolt LC decided not to participate in IDA, from technical point of view one transfer station in Targu Secuiesc locality was considered the optimum solution for IWMS implementation. No other sites were analysed.

### **7.4. Closure of existing Urban Landfills**

With regard to the closure and capping of the existing urban landfills, various technical options have been investigated, including:

- Cleaning of the landfill's site;
- Various alternatives for closure of the landfills.

The following alternatives were studied for the closure of existing urban landfills:

- 1) Option "zero" – do not realize the landfill closure;
- 2) Cleaning the landfill site by loading and transporting the waste to another location ;
- 3) Landfill closure by capping system:
  - impermeabilization with HDPE 2 mm liner;
  - impermeabilization with clay layer of 1 m width
  - impermeabilization with GCL

For urban landfill closure, alternative 3 was chosen with HDPE liner of 2 mm.

## **8. MAIN CONCLUSIONS OF IMPACT ASSEMENT**

During the operation period, the impact is considered to be positive. Specially, the public hygiene, social and economic conditions will be significantly improved by an integrated waste management system. The project has as main purpose the environmental improvement and protection.

The negative impacts are related to the construction period and mitigation measures have been considered in this regard.

The negative impacts during the operation period and the visual impact will be reduced by correct design of system components.

## **9. MONITORING**

The monitoring plan foresees:

- Monitoring environmental quality;
- Monitoring technology;
- Monitoring after site closure.

The system for monitoring the landfill after closure consists of:

- i. Monitoring of groundwater: monitoring wells placed one upstream and two downstream of landfill site; chemical and biological parameters will be monitored, the analysis will be conducted in accredited laboratory according to legal norms.
- ii. Monitoring of capping system: visual inspections of landfill cap in order to prevent and correct the land sliding, subsidence of final layer, uncontrolled growth of vegetation
- iii. Monitoring of gas emissions : FID detector