European Bank for Reconstruction and Development

KHMELNITSKY SOLID WASTE PROJECT

Non-Technical Summary

70057536/NTS
FEBRUARY 2020

PUBLIC

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FINAL PUBLIC

PROJECT NO. 70057536

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DATE: FEBRUARY 2020

CONTENTS

TABLES

FIGURES

APPENDICES

ABBREVIATIONS

CESMP	Construction Environmental and Social Management Plan
COD	Chemical Oxygen Demand
EBRD	European Bank for Reconstruction and Development
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESP	Environmental and Social Policy
EU	European Union
GHG	Greenhouse Gas
Ha	Hectare
HDPE	High-Density Polyethylene
IBA	Important Bird Area
LFG	Landfill Gas
LRF	Livelihood Restoration Framework
LRP	Livelihood Restoration Plan
MBT	Mechanical Biological Treatment
MSW	Municipal Solid Waste
KM	Kilometre
NTS	Non-Technical Summary
OESMP	Operational Environmental and Social Management Plan
PR	Performance Requirements
SEP	Stakeholder Engagement Plan
SWM	Solid Waste Management

1 INTRODUCTION

1.1.1. The European Bank for Reconstruction and Development (herein known as 'the EBRD') is considering providing a senior loan to the communal enterprise Spetskomuntrans (herein known as 'the Company'), a municipal company in the city of Khmelnitsky (herein known as the 'City'). The proposed loan will be used to facilitate the development of an integrated Solid Waste Management (SWM) system by:

- Closing and rehabilitating the existing landfill;
- Constructing a new engineered landfill (the 'proposed landfill'); and
- Construction of a Mechanical Biological Treatment (MBT) Facility.

1.1.2. The development is herein referred to as the 'Project'. The land upon with the Project will be developed is herein referred to as the 'Site'.

2 WHAT IS THE PURPOSE OF THE NON-TECHNICAL SUMMARY

2.1.1. This Non-Technical Summary (NTS) provides an easy to understand summary of the information that is provided in the Environment and Social Impact Assessment (ESIA) Report. The purpose of the NTS is to help the public to understand: the project background, project description, the ESIA process, the potential adverse environmental and social effects of the Project, and the mitigation measures proposed to enhance the benefits and avoid or reduce adverse effects.

3 PROJECT NEED AND BACKGROUND

3.1.1. The City's Municipal Solid Waste (MSW) generation was approximately 92,000 tons per annum in 2017 and is anticipated to increase to approximately 107,000 tons per annum within 10 years. Nearly all of this waste is landfilled, with no prior treatment at the existing landfill, which located on the Site. The existing landfill has been in operation since 1956, and is approaching maximum capacity, and therefore the need for an integrated SWM system is increasingly pressing. There is a lack of operational landfill sites within the vicinity of the City and if a replacement landfill is not provided the existing landfill capacity will be exhausted. This would inherently lead to an increase in illegal waste dumping and fly-tipping.

3.1.2. The existing landfill is not engineered or operated to European Union (EU) Standards and several major fire events have occurred, most recently in April 2018. These events did not result in casualties, but they re-emphasis the need for an integrated SWM system for the City.

4 WHAT ARE THE AIMS OF THE PROJECT?

4.1.1. The existing landfill is approaching maximum capacity and the City of Khmelnitsky's MSW waste generation is set to increase in coming years from approximately 94,000 tons per annum (recorded in 2017) to 107,000 tons per annum by 2027. The principal aim of the Project is to provide waste processing capacity for the City. The project also aims to improve the waste management operations and introduce recycling capabilities to the City's waste management infrastructure (in the form of the proposed MBT facility) and divert waste from landfill. Furthermore, it is anticipated that the Project, once constructed, will be integrated in the regional SWM Plan for the Khmelnitsky Oblast.

5 WHAT DOES THE PROJECT INVOLVE?

5.1.1. The Project will result in the creation of a modern integrated Solid Waste Management (SWM) system for the City. Figure 4-1 shows the Project, divided into its three primary elements. The Project consists of the following elements:

- **Element 1** - The closure, capping and rehabilitation of the existing landfill which will include:
  - The capping of the disposal area, including measures to prevent excessive rainwater input and leachate generation, and to prevent interference with the Landfill Gas (LFG) Collection System;
  - Transfer of the LFG Collection System to a new location; and
  - Reshaping the existing landfill body to stabilise the slope and prevent sliding, including surface water runoff measures and treatment options for the existing leachate pond from which leachate is currently collected for recirculation.
- **Element 2** - Construction of a new engineered landfill cell (total capacity will be between 500,000 to 700,000 tons of MSW), which will include:
  - A natural geological barrier, improved with geosynthetic clay liners and a High-Density Polyethylene (HDPE) lining system;
  - A leachate collection drainage layer and piping system for leachate collection; and
  - A LFG collection layer and system (above the waste layer).
- **Element 3** - Construction of a proposed MBT Facility to the north of the existing landfill. The proposed MBT facility will have a processing capacity of approximately 107,000 tons of MSW per annum (approximately 300 tons per day) and will include:
  - Mechanical processing (sieving) with a material recovery sorting line to extract materials which are suitable for recycling;
  - Refuse Derived Fuel (RDF) fuel production; and
  - Composting of the MSW organic fractions by aeration and stirring enclosed in metal sheets.
- Further elements include:
  - Upgrading equipment with at least one additional bulldozer and a compactor;
  - The provision of road improvements, signage, fencing and fire prevention / fire extinguishing measures; and
  - Overall improvements to the operational procedures.

5.1.2. In total, the Project will cover an area of 20.5 hectares (ha), divided into the following components:

- Closure and rehabilitation of existing landfill – 8.9 ha;
- Proposed Landfill – 6 ha; and
- Proposed MBT Facility – 5.6 ha.

5.1.3. Figure 5-1 show the elements of the Project and includes the physical footprint of the Project.

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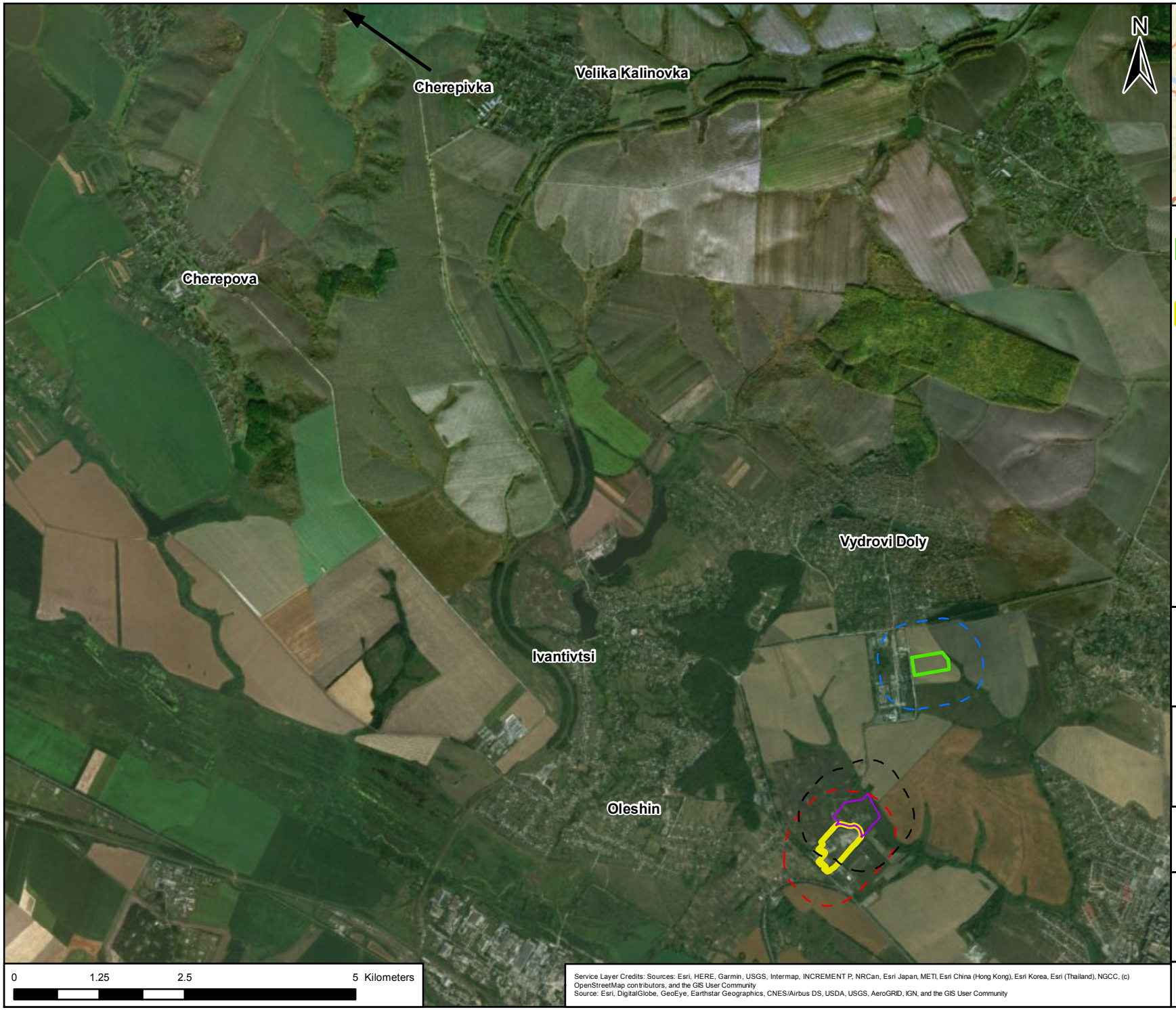


Key

- Proposed MBT Facility
- Potential Sanitary Protection Zone (MBT)
- Existing Landfill
- Proposed Landfill
- Sanitary Protection Zone
- Potential Sanitary Protection Zone (Landfill)

0 1.25 2.5 5 Kilometers

Client: EBRD

Project: KHMELNITSKY SOLID WASTE PROJECT

Title: Figure 5-1
Project Location Plan

Date: 08/08/2019 Scale: 75,000 @ A4

Drawn: PM Checked: DE Approved: JW

6 WHAT ARE THE TIMESCALES FOR THE PROJECT?

6.1.1. The Construction Phase is expected to begin in 2021/2022, and last between two and four years, with completion in either 2023/2024 or 2025/2026. It will be constructed in three phases: the first phase will be the construction of the proposed landfill and it will become operational in 2021. The second phase will be the construction of the proposed MBT facility will after the proposed landfill becomes operational. The third phase will be the closure, capping and rehabilitation of the existing landfill, after the construction activities for the proposed landfill and MBT facility have been completed. A detailed construction programme will be available at the detailed design stage.

7 WHERE IS THE PROJECT LOCATED?

7.1.1. The Project is located to the north of the city of Khmelnitsky, in the Khmelnitsky Oblast in western Ukraine. The existing landfill is located on the northern outskirts of the city, to the north of the Pivdennyi Buh River. The existing landfill lies to the north of Myru Avenue. To the south of Myru Avenue the land slopes downhill towards the Pivdennyi Buh River. The major roads that provide access to the Site are Zakhidna Okruzhna Street, to the south of the Site and Myru Avenue, to the south east of the Site.

7.1.2. The landfill is located outside the urban area of the city and is bound by agricultural land and/or villages on all sides. The villages surrounding the existing landfill include: Oleshin, Velika Kalinovka, Ivankivtsi, Cherepova and Cherepivka. The villages contain community facilities in the form of schools, an emergency centre, local hospital, dentist and shops. There are residential properties associated with these villages located near the Site, with the closest being located 70m to the south of the existing landfill.

7.1.3. The proposed landfill site will be located directly adjacent to the existing landfill, in the north-east of the site. The proposed MBT Facility will be located approximately 1km north of the existing landfill site. Figure 5-1 shows the Project location.

8 HAS STAKEHOLDER ENGAGEMENT TAKEN PLACE?

8.1.1. As part of undertaking the ESIA for the Project, the following stakeholder engagement and consultations have been undertaken to date, and further consultation is planned:

- **4th – 6th June 2019** - during the initial stage the core environment team undertook a site visit, to refine their understanding of the Project, collect baseline environmental and social data and consult with interested parties; and
- **1st – 5th July 2019** - a second site visit was undertaken by the core environment team and technical specialists to collect further baseline data, undertake environmental

Figure 8-1 – Presentation to Explain the Scoping / ESIA Methodology

and social surveys and undertake scoping consultation activities.

8.1.2. On the 3rd July a meeting that was held in Oleshin Village Hall with the head of the Village Council (Oleshin) and four other village heads from the surrounding villages. This meeting provided further information on the concerns and aspirations expressed by residents near to the existing landfill. Concerns related to the existing site include community health and safety, odour and interactions with the waste pickers.

8.1.3. Later, on the 4th July a WSP ESIA Specialist in collaboration with Spetskomuntrans provided a presentation about the Project to local representatives.

8.1.4. A Project Stakeholder Engagement Plan (SEP) has been prepared as part of the Project documentation, details of which are included in Chapter 12 of this NTS. The SEP sets out how local communities can get further information on the Project or ask any questions. Prior to the construction of the Project a Grievance Mechanism will be put in place, to enable communities to raise any concerns regarding the Project.

8.1.5. During the development of the ESIA and the national Environmental Impact Assessment (EIA), additional meetings / consultations will take place. The consultation activities are summarised in the table below.

Table 8-1 – Further Meetings / Consultations

Consultations on the ESIA:

- According to the EBRD PR 10, for Category A Projects, a public hearing will be conducted at the Village Hall in Oleshin (or equivalent) and the ESIA will be disclosed for a period of 120 days. The ESIA, Non-Technical Summary and Livelihood Restoration Framework (LRF) will be made available at the City Council Office, in the Mayor's Office in Khmelnitsky and in the schools (or equivalent) in all adjacent villages. The addresses of the schools (or equivalent) are:
  - Oleshyn School – 13a Shkilna Street, Village of Oleshyn, 31312
  - Ivankivtsi Lyceum – 2 Shkilna Street, Village of Ivankivtsi, 31314
  - Cherepova School – 2 Centralna Street, Village of Cherepova, 31316
  - Cherepivka School – 25 Trublaini Street, Village of Cherepivka, 31305

Consultations on the national EIA:

- Consultations with the public, providing sufficient time and opportunities to review EIA materials and participate in the decision-making process according to the detailed procedures outlined in the applicable Ukrainian Law (25-35 business days);
- Review of the EIA by the 'Authorised Body' (i.e. the Ministry of Ecology and Natural Resources), considering public opinion and an analysis of the information gathered by business entities during the public debate; and
- The Ministry of Ecology and Natural Resources shall also establish the Unified EIA Registry (to be available online, with a free access for public).

9 HOW HAS THE PROJECT BEEN ASSESSED?

9.1 UKRAINIAN REQUIREMENTS

9.1.1. The ESIA has been prepared in line with Law No. 2059-VIII 'On Environmental Impact Assessment' (2017) and its associated secondary legislation:

- Regulation No. 1010 'On Criteria for Determining Planned Activity, its Expansion and Change which are not Subject to the EIA'.;
- Regulation No. 989 'On Procedure for Conducting Public Discussion while Preparing the EIA'; and
- Regulation No. 1026 'On Procedure for the Transfer of Documentation to Provide the EIA Conclusion and the EIA Funding and on Procedure for Maintaining the Unified Register on the EIA'.

9.2 EBRD PROJECT REQUIREMENTS

9.2.1. The ESIA has been prepared following the guidance in the EBRD Environmental and Social Policy 2014[1] (ESP 2014). Specifically, the Project has been structured to meet the EBRD's Environmental and Social Policy (ESP) and Performance Requirements (PRs) 2014, which are as follows:

- PR1: Environmental and social appraisal and management;
- PR2: Labour and working conditions;
- PR3: Pollution prevention and abatement;
- PR4: Community health, safety and security;
- PR5: Land acquisition, involuntary resettlement and economic displacement;
- PR6: Biodiversity conservation and sustainable management of living natural resources;
- PR7: Indigenous (not applicable as there are no indigenous people likely to be affected by the Project);
- PR8: Cultural heritage;
- PR9: Financial intermediaries (not applicable to this Project as there are no financial intermediaries involved); and
- PR10: Information disclosure and stakeholder engagement.

9.2.2. The Project includes all reasonable measures to avoid, minimise or mitigate any adverse changes in environmental and social conditions, and impacts on public health and safety, especially with respect to any disproportionate impacts on any group of people as a result of their gender, age, ethnicity, disability, socio-economic status and / or other personal characteristics.

9.2.3. The Project takes into account international conventions and protocols relating to environmental and social issues, as transposed into national legislation.

[1] EBRD (2014). Environmental and Social Policy.

10 HAVE ALTERNATIVES BEEN CONSIDERED?

10.1.1. As part of the preparation of the ESIA several alternatives have been considered, including designs and location alternatives and the 'no project scenario'.

10.2 NO PROJECT SCENARIO

10.2.1. A 'do-nothing' scenario has been considered as an alternative to the Project. The following conditions are likely to remain or occur if the Project does not proceed:

- The City's waste generation would still increase to approximately 107,000 times per annum (within 10 years of 2017) and continue to push the existing landfill beyond its maximum capacity;
- The capacity of the existing landfill would be exhausted and the search for an alternative landfill would need to commence;
- As there is a lack of available operational landfill sites within the vicinity of the City, the cost of waste disposal would increase as waste sites that are further from the City would have to be used. There is also likely to be an increase in illegal waste dumping sites and fly-tipping, which would worsen existing pollution issues and creating new sources of pollution;
- The current leachate recirculation system and the associated issues would continue, potentially resulting in water and ground pollution and human health impacts; and
- Without providing an engineered landfill constructed and operated in accordance with EU standards, adverse effects on the surrounding environment, ground conditions and local communities would continue, resulting in adverse effects.

10.2.2. In summary, the existing waste processing and disposal facilities are not sustainable and is approaching maximum capacity. Without implementation of the Project there is likely to be an increase in adverse environmental effects. Therefore, the 'do nothing' scenario is not an acceptable alternative.

10.3 ALTERNATIVE LOCATIONS

PROPOSED LANDFILL

10.3.1. Alternative landfill locations were not considered in the assessment, due to the substantial benefits associated with continuing to manage waste at the Site. The proposed landfill location was identified as being the only practicable location, as it has existing waste operation systems, and it provides a valuable opportunity to reduce adverse effects associated with the existing landfill, while providing additional waste capacity.

PROPOSED MBT FACILITY

10.3.2. Three prospective locations were considered for the proposed MBT Facility. Location 1 was selected as it has the shortest journey distance from both the City and the proposed landfill when compared to locations 2 and 3.

ALTERNATIVE TECHNOLOGY

Proposed Landfill

10.3.3. The proposed MBT facility itself will provide an alternative technology to the landfill for a proportion of the waste. Further alternative technologies to the proposed landfill were not considered in the

assessment as regardless of the technologies used in the proposed MBT Facility, there will inevitably be a portion of MSW arisings that will require landfill disposal.

PROPOSED MBT FACILITY

10.3.4. Three different MBT Facility composting processes were considered in the assessment. The preferred process was selected because it had the lowest requirements for the construction of major infrastructure, had simple and easy to install equipment and a simple maintenance regime.

11 WHAT ARE THE LIKELY EFFECTS OF THE PROJECT?

11.1 AIR QUALITY

BASELINE

11.1.1. Although there is no available air quality data for the Site or the region, it is reasonable to assume that the current air quality is poor, due to the presence and operation of the existing landfill. Air quality data is being collected, including particulates and volatile organic compounds. The existing landfill is a windblown site, with no systematic waste segregation and minimal material control. This has the potential to be presenting a continuous dust risk to human health at residential dwellings located close to the existing landfill. The proposed remediation and capping of the existing landfill will reduce the current dust risk to human health.

11.1.2. The lack of segregation has resulted in conditions which produce uncontrolled odours. This has been confirmed from reports of repeated odour nuisance complaints at residential dwellings located close to the existing landfill and during site visits by the assessment team.

11.1.3. There is currently wind-blown dust being released from the existing landfill, and a proportion of this will contain micro-organisms, these airborne micro-organisms are known as bio-aerosols. Waste-pickers at the existing landfill are at risk of suffering ill-effects from exposure to the bio-aerosols that are currently being released from the existing landfill.

CONSTRUCTION

11.1.4. Construction activities that have the potential to generate and / or re-suspend dust include:

- Site clearance and preparation;
- Preparation of temporary access to the Site and haulage routes;
- Earthworks and landfill reprofiling;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Site;
- Use of crushing and screening equipment / plant;
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction of buildings, the landfill, roads and areas of hardstanding alongside construction processes;
- Internal and external finishing; and
- Site landscaping after completion.

11.1.5. In addition, emissions from vehicles and plant associated with the construction phase have the potential to effect local air quality the areas immediately adjacent to the site access.

11.1.6. Taking into consideration the baseline conditions and following the implementation of the mitigation measures (refer to 11.1.12), and good construction practice, the construction air quality effects are not considered to be significant.

OPERATION

11.1.7. The potential impact from road traffic emissions on sensitive receptors during the operational will be mitigated by using efficient vehicles, best practice techniques and management plans.

11.1.8. Operational dust associated with the proposed landfill and the proposed MBT facility is anticipated to be generated primarily from the off-site transportation. This will be managed by vehicles being required to use wheel washing facilities prior to exiting the site.

11.1.9. The proposed landfill and proposed MBT facility operations will result in a substantial reduction in the current odour levels, due to the improved waste management, waste segregation, and because the proposed landfill will be located further from sensitive receptors (i.e. residential dwellings) than the existing landfill.

11.1.10. The proposed landfill will have a far lower potential to release airborne particles of biological origin (bioaerosols) compared to the existing landfill. The segregation and treatment of waste at the proposed MBT facility will reduce the amount of waste containing biological particles at the proposed landfill. Furthermore, the potential for these biological particles to become airborne, will be reduced through the implementation of best practice techniques during operation.

11.1.11. The air quality effects are expected to be an improvement in relation to the existing situation and are not considered to be significant, taking into consideration: the baseline conditions, the proposed mitigation measures, and good site management practice.

MITIGATION

Construction

11.1.12. The mitigation measures proposed for the construction phase have been set out in an outline Construction Environmental and Social Management Plan (CESMP), which includes:

- Vehicle / Machinery emissions;
- Dust suppression;
- General Site Management including control of construction traffic;
- Site Waste Management Plan (SWMP) and Materials Management Plan (MMP;
- Transport Management Plan and Road Maintenance and Restoration Plan.

Operation

11.1.13. The mitigation measures proposed for the operation phase are set out in an outline Operational Environmental and Social Management Plan (OESMP), and include measures such as:

- The positioning of dust-generating activities;
- Specification of equipment and vehicles;
- Vehicle movements and management;
- Soil management and materials handling;
- General site management;

- Communications with the surrounding community;
- Planning of activities; and
- Material and waste storage.

11.2 NOISE AND VIBRATION

BASELINE

11.2.1. A noise survey was undertaken to determine the existing noise climate at noise sensitive receptors near the existing landfill, the proposed landfill and the proposed MBT facility. Noise levels across the survey area varied from around 50dB (comparable to a quiet suburban area) in the rural locations and up to a maximum of around 70dB (comparable to a vacuum cleaner) immediately adjacent to the active landfill machinery.

CONSTRUCTION

11.2.2. Large amounts of material will be moved as part of the construction phase. At this stage it is considered likely that there will be a temporary increase of the ambient noise levels at the residential dwellings (within close proximity to the road and the proposed MBT facility) and informal residential dwellings (adjacent to the existing landfill boundary). Locations which may be particularly affected during the construction phase are likely to be those in Vydrovi Doly overlooking site for the proposed MBT facility and any properties on the land to the south of the existing and proposed landfill. There is the potential for vibration effects to occur depending on the construction techniques used and whether piling is required.

11.2.3. The noise and vibration effects are not expected to be significant, following the implementation of the mitigation measures in the CESMP.

OPERATION

11.2.4. Although the following activities will generate noise, the effects are not expected to be significant:

- Noise arising from the machinery once the proposed MBT facility is open, such as vehicle movements and mechanical processing;
- Compaction machinery at the proposed landfill; and
- Road traffic noise associated with vehicles accessing the proposed landfill and proposed MBT facility.

MITIGATION

11.2.5. A Noise and Vibration Management Plan will be implemented during construction as outlined in the ESMP. This will set out the construction mitigation, including the Best Practice Means that will be adopted where possible in the construction activities associated with the proposed MBT facility and local access road improvement.

11.2.6. It is recommended that a daytime noise limit and a vibration limit is applied at the façade of any noise sensitive receptor during the construction phase. If night-time construction activities are required, then a limit should be applied.

11.2.7. No mitigation measures are required for the operation of the Project, as the effects are not significant.

11.3 ECOLOGY

BASELINE

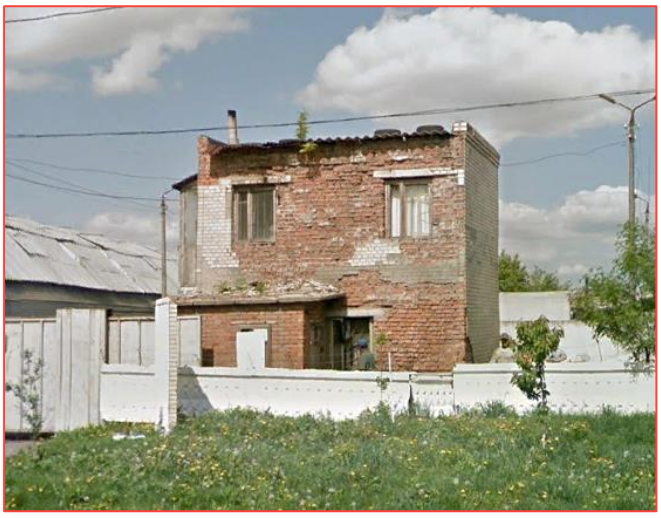
11.3.1. The Site is not located within an area designated for its importance to biodiversity. There is one designated area which has a connectivity with the Site. This designated area is the Pivdennyj Bug River Valley Important Bird Area (IBA) which is located 10km east of the Site. This site has been considered in the ecology assessment.

11.3.2. The existing landfill is occupied by active landfill operations. The proposed landfill location extends across an area of mixed of grasses and herbs, which has been subject to illegal dumping as a result of the existing landfill spreading in to surrounding areas. The proposed MBT Facility is located within an area dominated by arable agricultural land use.

11.3.3. The Site is not considered to support any important populations of plant or animal species that are of increased conservation value. The existing landfill is known to support common scavenging animals including white stork, gulls and rodents such as mice and voles, which will likely forage across the existing landfill, and in turn will attract predators such as foxes, feral cats and dogs.

11.3.4. Nesting birds and roosting bats (where suitable structures exist, and where levels of disturbance do not prevent roosting) are likely to be making use of the existing landfill. Figure 11-1 shows a building with bat roost potential; such structures may also support nesting birds, in particular barn swallow.

Figure 11-1 - Existing Landfill Building with Bat Roosting Potential



11.3.5. The location of the proposed landfill is likely to support a greater number of nesting birds due to the undisturbed nature of the vegetation and the presence of areas of scrub. The likelihood of the location supporting nesting birds will increase with as the distance from the existing landfill increases.

11.3.6. The Site is likely to support several invasive species. Hogweed, either Sosnowsky's hogweed or giant hogweed, was confirmed as being present on and around the existing landfill, both of which pose a risk to public health and safety due to toxins contained within the plant sap.

CONSTRUCTION

Existing landfill

11.3.7. The integrity of the local bat population is not likely to be affected significantly mainly due to the prevalence of more suitable (and abundant) roosting features across the surrounding area. The overall effect is therefore not considered to be significant.

11.3.8. Vegetation and built structures on site may support breeding birds. Although vegetation clearance will have an impact but given the mobility of this animal group and the likely presence of suitable similar habitat in the surrounding area, any effects are not considered to be significant.

11.3.9. Construction activities have the potential to facilitate the spread of invasive species across the wider area. Despite the inherent ease and speed with which such plant species spread, the overall effect is not considered to be significant with the implementation of mitigation measures.

Proposed Landfill

11.3.10. The construction of the proposed landfill will result in the loss of nesting bird habitat, as areas of vegetation and scrub will be cleared to make way for the new landfill. However, given the abundance of similar (and superior) nesting habitat in the wider area, any effects are not considered to be significant.

Proposed MBT Facility

11.3.11. The proposed MBT Facility will be located within arable field(s). There is a slight possibility that these fields will be of use to foraging geese associated with the IBA, however, the Site represents less than 1% of available habitat, should it be used by foraging IBA birds. Therefore, any effects upon the IBA as a result of construction of the proposed MBT Facility are not considered to be significant.

OPERATION

11.3.12. The existing landfill and the proposed landfill sites are already disturbed by the operation of the landfill, so any effects upon animals and plants once the proposed landfill is opened are not considered to be significant. The expansion of landfill activities is likely to increase the numbers of scavenging animal species, but not to the extent that any additional assessment is required, especially as the net scale of landfill operations will decrease from 8.9ha (current position) to 6ha once the current landfill is closed and rehabilitated

11.3.13. Operational activities have the potential to further facilitate the spread of invasive plant species across the Project and the wider area (i.e. through vehicle movements in/out of the proposed MBT Facility and proposed landfill) displacing native species in the process. The overall effect is considered to not be significant with the implementation of mitigation measures.

MITIGATION

11.3.14. Although the loss of the habitat within the proposed MBT Facility site is not likely to have a significant effect on geese associated with the IBA, a pre-works check of the proposed MBT facility location to confirm the lack of use of this field by foraging geese will be undertaken.

11.3.15. There will be pre-works surveys of any mature trees/buildings to be affected by the Project. If rehabilitation / felling works are required for these buildings and trees, then bat surveys will be undertaken prior to construction. Roosts should be retained and/or provision of artificial roost features should be provided where appropriate.

11.3.16. All breeding birds are protected under the provision of the EU Birds Directive. The removal of vegetation has the potential to impact upon them through the destruction of nests or eggs. Mitigation to avoid this impact is included in the ESMP, such as timing the works to avoid nesting period (March to August inclusive) and the provision of landscape planting to provide additional suitable nesting resource.

11.3.17. The spread of invasive species will be prevented though the production and implementation of an Invasive Species Management Plan, as outlined in the ESMP.

11.4 CULTURAL HERITAGE

BASELINE

11.4.1. Prehistoric archaeology is believed to be present to the north of the city boundary, as indicated by mound 169 which is just over 1km from the Site. There are settlements from the Iron Age, including Str. Bandera and the Micro-district of Zarichchia, located within the city borders of Khmelnitsky.

CONSTRUCTION

11.4.2. The construction of the Project has the potential to impact on below-ground heritage assets, within the Site and the surrounding area. Below-ground archaeological resource can be subject to impacts due to machinery, vibrations from equipment and soil removal, and a change in water levels. The presence of the mound 169 over 1km from the Site, indicates that there is the potential for archaeological deposits relating to the Iron Age period, likely to be of Prehistoric date, to be present within the Site and surrounding area. The risk of adverse effects on below ground archaeology will be mitigated though a Chance Find Procedure.

OPERATION

11.4.3. The operational phase will result in the movement of waste collection and transportation vehicles throughout the City, including near to above-ground and below-ground heritage assets. This could impact on archaeological priority zones surrounding heritage assets, which could change the overall experience of the heritage asset. However, as these routes are already in use throughout the City due to the Existing Landfill, these effects are not expected to be significant.

MITIGATION

Pre-Construction Mitigation

11.4.4. The ESMP includes a Cultural Heritage Management Plan (CHMP), as recommended in PR8, which will cover the pre-construction and construction phases. The CHMP identifies a series of steps that will be undertaken, by the Contactor, which includes a pre-construction site walkover.

Construction Phase

11.4.5. A Chance Find Procedure, aligned with EBRD PR8, will be set up to mitigate for potential chance finds during the construction phase. In the event of a chance find, construction work will be temporarily suspended, while the competent authorities identify the find, record it and identify the importance. This procedure will be documented in the CHMP, which is outlined in the ESMP. The CHMP will outline all the requirements, procedures, resources and skills and timeline needed to minimise impacts on cultural heritage assets.

11.4.6. Mitigation measures for the construction phase include:

- Planning operation and maintenance activities to take into account potential identified cultural remains;
- Implementing the Code of conduct, awareness raising, and training for workers and personnel involved during the construction phase; and
- Implementing the monitoring and reporting requirements in the ESMP.

11.4.7. No mitigation measures are required for the operation of the Project as the effects are not significant.

11.5 LANDSCAPE AND VISUAL

BASELINE

Landscape Designations

11.5.1. The closest National Parks to the Site are Upper Pobozhia National Nature Park, Podilsji Tovtry National Park and Lower Polissia National Park. All of these parks are too distant (more than 32km away) to be impacted by the Project.

11.5.2. A desktop analysis of the area surrounding the Site identified an area of mature (possibly ancient) woodland and the Pivdennyi Buh river. The river has been dammed at Kam'yanets'ka Street creating a substantial reservoir which has a wooded island called Shrobtak Island. Two parks are located at the eastern end and south of the reservoir which include leisure facilities. There are no public paths or trails located with the study area.

Local Landscape Character

11.5.3. The study area comprises five distinct character areas:

- Character Area 1: River and riverine terraces;
- Character Area 2: Industrial/Former Industrial Site;
- Character Area 3: Large Scale Agricultural Farmland;
- Character Area 4: Residential Settlements/Small Scale Agricultural Land; and
- Character Area 5: Mature Woodland.

Artificial Lighting

11.5.4. There is existing street lighting along Myru Avenue, and sporadic street lighting along Zakhidna Okruzhna Street. Within the existing landfill, there are several street lights on the access roads towards the south of the existing landfill, and in the vicinity of the existing processing facilities and buildings. The northern parts of the existing landfill are largely taken up by the waste mound / tipping area and appear to be unlit. Vehicles accessing the Site would clearly need to use lights at times of low lighting, and it is likely that these would on occasion be visible due to the elevated nature of the land. Limited lighting is present within the residential area of Oleshin to the west but given its proximity to the existing landfill it is unlikely that there will be significant light spill from the into the residential areas.

Visual receptors

11.5.5. Visual receptors within the study area have generally short-distance views of the Site, from surrounding residences, local businesses, users of surrounding access tracks and highways, and from the surrounding fields. There are some receptors that may have mid to long range views of the Project, including a sports pitch in Oleshyn and a number of residential receptors towards the outer extents of the study area (2km from the Site).

CONSTRUCTION

11.5.6. Use of construction machinery and construction works will create increases in noise, dust and activity, along with potential traffic management requirements on surrounding highways. The capping and covering of the existing landfill will result in some potential improvement of local landscape character and visual amenity by visually covering landfill material with a less visually intrusive capping layer.

11.5.7. The construction effects on landscape character and visual receptors are anticipated be significant, although this will be a temporary effect during the construction period.

OPERATION

11.5.8. The Project will result in increased traffic volumes along the highway, and increased activity within the Site itself. As such, there is the potential for a greater awareness of activity on surrounding roads as well as noise, activity and visual intrusion from new buildings and/or extended site operations. Whilst covered sections of the existing landfill site will be of benefit, there will be an overall extended built area, vehicular activity and visible operational area within the landscape.

11.5.9. The effects on landscape character are not anticipated to be significant. The effects on the visual receptors are anticipated to be significant at some locations and non-significant at other locations, depending on the receptor's visibility of the Site (the greater effect the more visible the Site is).

MITIGATION

11.5.10. An ESMP has been prepared and contains landscape mitigation measures including a Landscape Management Plan.

11.5.11. The following will reduce adverse effects of the Project on surrounding landscape character and visual amenity during construction:

- Removal / loss of natural and semi-natural habitat should be minimised throughout;
- Minimise the use of artificial lighting on the Site and where needed, use directional lighting;
- Regrade, cap and cover existing landfill site to contours that appear natural and as sympathetic to the existing landform as possible;
- Covered sections to be planted up with suitable planting of grasses, wildflowers and / or shrubs; and
- New tree and hedge / shrub planting to be planted around the Project boundaries. Plants to include low, medium and tall-growing species and planted into a suitable depth of appropriate topsoil to aid establishment and provide some screening of the Project.

11.5.12. The following will reduce adverse effects due to the Project, on surrounding landscape character and visual amenity during operation:

- Plant any completed landfill sub-cells with suitable planting of grass / wildflower / shrubs as soon as the cell becomes filled and non-operational;
- Ensure suitable establishment of tree / scrub / hedgerow / vegetation planting to maximise screening properties; and
- Ensure regular covering of landfill cells to minimise wind-blown litter and dust and reduce visual intrusiveness of landfill operations.

11.6 SURFACE WATER ENVIRONMENT

BASELINE

11.6.1. The closest surface water features to the Site are the wetland pond associated with the existing landfill and an unnamed stream adjacent to the north and northeast of the existing landfill and adjacent to the proposed landfill. These features are all located downhill of the Project and neither are utilised by the local villagers for water supply. The stream is known to dry out during summer months. The unnamed

stream drains east and joins the Pivdennyi Buh River. At the northern edge of the existing landfill, there are leachate ponds.

11.6.2. The Pivdennyi Buh River is a major river that traverses the country and ends in the Black Sea. The Pivdennyi Buh River is a source of water for the City of Khmelnitsky and is located 1.5km to the south-west from the Project at its closest point. The Pivdennyi Buh River is dammed in the City of Khmelnitsky and forms two reservoirs for water supply and amenity value.

11.6.3. Rainfall interacting with the Project will drain indirectly to the Pivdennyi Buh River via the unnamed stream and potentially via groundwater pathways.

11.6.4. In May 2018 samples were taken from the wetland pond and stream located to the north and northeast of the existing landfill. In addition, samples of leachate and unnamed streams 500m upstream and 500m downstream of the existing landfill were analysed in April 2019. The results from analyses showed that the Ukrainian surface water standard for chloride, Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), iron and manganese were exceeded in the sample from the wetland pond. Levels of COD, iron and manganese in the north-east stream also exceeded the Ukrainian surface water standards.

CONSTRUCTION

11.6.5. Although there are no records of such activity, hazardous waste (inclusive of radioactive materials) may have been deposited in the existing landfill. Humans may be affected by radioactivity via many potential pathways during construction, such as direct contact with landfill, contact with or ingestion of leachate, contact with or ingestion of contaminated soils, so this potential risk will need to be managed.

11.6.6. The effects to surface waters during the construction phase of the Project include:

- The excavated material will be temporarily stockpiled, this has the potential to migrate to the un-named stream and wetland, effecting the quality of surface waters at and downstream of the Project via runoff;
- Construction activity around the existing landfill has the potential to erode and release contaminants to surface waters downstream of the Project, including mobilisation of leachate containing materials;
- Flooding of temporary leachate storage ponds (if required during construction works affecting the existing leachate system).
- There is potential for previously contaminated soils to be mobilised towards the unnamed stream and wetland due to flooding of the temporary leachate storage ponds during construction;
- There is a risk of oil and / or petroleum leaks / spills from machinery and vehicles used during the construction phase, which could result in surface water contamination; and
- The movement of vehicles coming in and out of the landfill can lead to the spread of soils and materials outside of the Site, which can potentially cause contamination of surface waters downstream of the Project.

11.6.7. Due to the distance from the Project and considerable effects of additional dilution, it is considered the effects will be lessened on the Pivdennyi Buh River.

11.6.8. With the identified mitigation measures in place, it is anticipated that construction effects to surface waters, due to the Project, will not be significant.

OPERATION

11.6.9. The effects to surface waters during the operation phase of the Project include:

- The operation and management of the proposed landfill and the closure of the existing landfill (capping and removal of the leachate storage ponds), will lead to a reduction in the migration of contaminated groundwater towards the unnamed stream and wetland area north of the existing and proposed landfills;
- The leachate management system will prevent the mobilisation of leachate and contaminated soils towards the unnamed stream and wetland north of the landfill;
- A leachate treatment plant will be installed and only water treated to national standards will be discharged from the proposed Landfill. The discharge will be via a closed pipe to the sewer system where it will be directed to the City's sewage treatment plant. The consequence of leachate management will be a near complete reduction in uncontrolled release of leachate to local surface water receptors;
- The residual leachate accumulating in the base of the proposed landfill has the potential to move through the base of the landfill into groundwater and potentially to the unnamed stream and wetland area. This leachate will be managed to limit the migration of contaminants. It is anticipated that control measures implemented during operation will limit the impact on the water environment to acceptable levels.
- There is a risk of oil and / or petroleum leaks / spills from machinery and vehicles used during the operational phase, which could result in surface water contamination, that will be managed; and
- The movement of vehicles coming in and out of the proposed landfill can lead to the spread of soils and materials outside of the Project, which can potentially cause contamination of local surface waters downstream of the Project, but this will be managed with wheel washing and other measures in the ESMP.

11.6.10. With the mitigation measures in place it is anticipated that effects to surface waters as a result of the Project will not be significant during operation.

MITIGATION

11.6.11. The mitigation and enhancement measures proposed for the construction phase are outlined in the ESMP. These include the following measures:

- Control of contamination from stockpiles and mobilisation of contaminated soils;
- Management of flooding of temporary leachate ponds;
- Preventive measures to avoid exposure of waste and leachate during construction;
- Provision during vehicles movements; and
- Provision to prevent impact to surface waters from oil and / or petroleum leaks.

11.6.12. The mitigation and enhancement measures proposed for the operational phase are outlined in the ESMP. These include the following measures:

- Provision of leachate extraction management system and treatment plant (leachate management plan);
- Provision during vehicles movements; and
- Provision to prevent impact to surface waters from oil and / or petroleum leaks.

11.7 GEOLOGY AND HYDROGEOLOGY

BASELINE

Geology

11.7.1. The existing landfill and proposed MBT site are situated in an area that is underlain by clastic sediments, primarily clays, sands and sandstones. The existing landfill is within a disused clay pit, and it is unlikely to be lined or contained.

11.7.2. Soil sample data from the location of the proposed landfill from May 2018 revealed elevated levels of iron in all samples.

Hydrology

11.7.3. There are multiple aquifers around the existing landfill. Certain villages, such as the village of Oleshyn, draw water from shallow aquifers, and the City draws water from deeper aquifers for public supply. The village of Oleshyn is in a different drainage catchment to the existing and proposed landfill.

11.7.4. The water quality assessment summarising water quality from local wells revealed elevated nitrates, which suggests impacts from pollution relating to agricultural activities. The detection of E-Coli bacteria suggests some local wells are impacted by poor hygiene practices at the surface near those wells.

11.7.5. The properties located within the SPZ, and other properties to the south of the Site, use mains water from the system that supplies the Municipality of Khmelnitsky. It is reasonably assumed that this municipal water supply meets the required water quality standards. However, some also have wells that they use occasionally when the mains water supply is interrupted.

CONSTRUCTION

11.7.6. During construction, the Project is likely to have the following effects to geology and hydrology, which will need to be managed using the measures in the mitigation section:

- There is a possibility that hazardous (inclusive of radioactive) waste may have been deposited in the landfill. Excavation could lead to the exposure of radioactive and/or contaminated materials, and the potential risk to construction workers will need to be managed;
- Excavation of soils and potentially contaminated materials and re-profiling of existing landfill waste could lead to unintentional mobilisation of leachate containing materials directly into groundwater or to adjacent agricultural soils or indirectly into surface water;
- Stockpiling of soils and potentially contaminated materials that could migrate to shallow groundwater and adjacent agricultural soils;
- Pollutants from the existing landfill (closed and capped as part of the Project) will continue to migrate away from the landfill through the base and sidewall of the existing landfill to groundwater, although the installation of leachate collector drains will reduce leachate migration from the Site and result in a slight improvement;
- Flooding of temporary leachate ponds could lead to the uncontrolled mobilisation of leachate and or leachate containing materials directly to groundwater and agricultural soils, and indirectly to surface water, which will need to be managed;
- Risk of oil and / or petroleum leaks / spills from machinery and vehicles used during the construction phase, which could result in contamination of agricultural soils adjacent to the Project; and

- The movement of vehicles coming in and out of the landfill can lead to the spread of soils and materials outside of the Site, which can potentially cause contamination of agricultural soils adjacent to the Project, but this will be prevented by wheel washing and other measures in the ESMP.

11.7.7. The construction effects associated with the potential risk of exposure of construction workers to excavated radioactive and/or contaminated materials, will be mitigated though measures in the ESMP, and is not considered to be significant.

11.7.8. The other construction effects on geology and hydrology, due to of the Project, are not considered to be significant, following the implementation of the mitigation measures.

OPERATION

11.7.9. During operation, effects to geology and hydrology as a result of the Project are anticipated to include:

- Residual leachate accumulating in the base of the proposed landfill has the potential to move through the landfill liner[2] into groundwater, but this will be reduced through the extraction of leachate and treatment in the Leachate Treatment Plant;
- Risk of oil and / or petroleum leaks / spills from machinery and vehicles used during the operational phase, which could result in contamination of agricultural soils adjacent to the project, and will be managed though good operational practices, as set out in the ESMP; and
- The movement of vehicles coming in and out of the landfill can lead to the spread of soils and materials outside of the Site, which can potentially cause contamination of agricultural soils adjacent to the Project, which will be managed though wheel washing and other measures in the ESMP.

11.7.10. The operational effects on geology and hydrology will not be significant, following the implementation of the mitigation measures.

MITIGATION

11.7.11. The mitigation and enhancement measures proposed for the construction phase of the Project are outlined in the ESMP. Mitigation includes:

- Management of leachate levels
- Engineering and design of temporary ponds.
- Standby pumps and tanker for emergency pumping of leachate.
- Measures to avoid direct contact with waste, leachate and soil.
- Testing and removal of contaminated material arising from the existing landfill.
- Routine monitoring of radioactivity during construction.
- The use of personal radiation detectors.
- Specific measures during ground investigations.
- Provision of spill kits to contain oil / petroleum leaks or spills.
- Program to ensure good driver behaviour / maintenance of vehicles.

[2] Landfill liner: The landfill liner is the first defensive position against water leaching into the groundwater.

11.7.12. The mitigation and enhancement measures proposed for the operational phase of the Project include designing the landfill in line with EU Landfill Directive standards and international best practice and applying Best Available Techniques during operation. Measures are outlined in the ESMP.

11.8 SOCIAL

BASELINE

Socio-economic characteristics

11.8.1. The Project is located in the City of Khmelnitsky, the largest city in the Khmelnitsky region with a population of 265,583 (as of 1 January 2018).

11.8.2. Ukraine has one of the highest rates of public spending on education in the world, spending nearly 6% of GDP on education in 2017. Despite the high rate of spending on education, Ukrainian schools often lack adequate facilities, equipment and textbooks. There are 39 educational institutions in the Khmelnitsky region. There are waste-pickers on the Site, who may have low literacy levels and the engagement to date indicates that some may not speak Ukrainian.

11.8.3. The number of health care or medical institutions in Ukraine has dropped substantially in recent years. Khmelnitsky City has 17 hospitals and out-patient medical institutions. The most common diseases in Ukraine are respiratory diseases with 12 million new cases in 2017.

11.8.4. The unemployment rate in Khmelnitsky region is 4.42%, which is lower than the national average of 9.1%. In 2017, the main three sources of employment in the Khmelnitsky region were: agriculture, fishing and forestry (27.9%); wholesale, retail trade, repair of motor vehicles and motorcycles (22%); and industry (12.2%)[3].

11.8.5. In Ukraine, the minimum age for work is 16. However, the Labour Code allows children to be employed at age 15 with parental consent. In secondary or vocational schools, students may perform light work at age 14 with parental consent, provided that the work does not interfere with their education and is not harmful to their health. During the landfill observations two adolescent males were spotted near the waste pickers' cabins, who were approximately 13-14 years old.

11.8.6. The number of offences detected nationally has increased substantially between 1990 and 2017, from 369,809 to 523,911, a percentage increase of 41.7%. Corruption is one of the biggest issues in Ukraine. Interviews with local deputy villages raised concerns associated with alcoholism, and gender violence in the Khmelnitsky city and surrounding villages.

Labour and Working Conditions

11.8.7. There is a lack of monitoring of working conditions and health and safety issues. The occupational health and safety (OHS) at the current landfill site is poor and several risks to the health and safety of workers, contractors and others are present at the existing landfill.

[3] State Statistics Service of Ukraine (2017). Employed Population by Economic Activities and Regions in 2017.

Affected People

11.8.8. The groups affected by the Project include:

- Roma waste pickers working at the existing landfill. There are currently between 20 to 60 Roma waste pickers with numbers varying throughout the year;
- Residents of houses within the Sanitary Projection Zone (SPZ) (built with or without necessary permits). Most of these houses have fruit and vegetable gardens;
- Vulnerable groups.

11.8.9. Within the context of the Project, and according to the EBRD PR1, some individuals or groups are more vulnerable than the majority of the affected population and, if affected by the Project, will therefore require the implementation of special livelihood restoration and/or assistance measures. Such groups might include:

- Roma waste pickers (men and women) who work at the existing landfill;
- Owners of structures (built without necessary permits), with no other property or place of residence;
- Persons who depend on the affected land for incomes/livelihoods and whether it is the only land they own or use;
- Elderly and women single headed households, single parent households, households with multiple members, or those living below the poverty line;
- Persons who could be affected by economic displacement;
- Persons whose socio-economic status is low, for example beneficiaries of social welfare; and
- People with low-literacy levels.

Gender

11.8.10. In 2018 women made up more than half of the population of Ukraine (53.7%). According to the UNDP 2017, female labour force participation is 46.9% compared to 63% for the male labour force[4]. On average, women's monthly wages are approximately 25% lower than men's[5].

11.8.11. Despite the implementation of measures to increase gender equality, Ukrainian women still face challenges as a result of patriarchal attitudes, stereotypes, weak laws and a lack of political support.

11.8.12. In relation to informal waste picking, only five women out of 35 to 36 waste pickers (approximately 14%) were observed at the existing landfill dump site and none participated in the focus group discussion. Women waste pickers may be more vulnerable than men. The Company does not currently have a gender equality policy, but they plan to develop one as part of the Project.

Land Acquisition

11.8.13. The Company is carrying out its land acquisition programme in three Phases as shown below:

- Phase 1 – Acquisition of 17,357 Hectares (rounded number, ha) spread between 14 land plots acquired;
- Phase 2 – Acquisition of 2,238ha (rounded) spread between 20 land plots; and

[4] UNDP (2017). Gender Inequality Index, Ukraine.
[5] State Statistics Service of Ukraine (2019). Average Monthly Wages by Sex and Type of Economic Activity in Industry over the Quarter in 2019.

- Phase 3 – The phase 3 plots will be for future development by the Company and are outside of this Project.

11.8.14. The land acquisition programme for Phase 1 and 2 (the proposed landfill) has been completed.

11.8.15. The land plots required for the proposed MBT Facility are not part of the Phase 1 to 3 land acquisition programme. The land plots are currently designated as “agricultural use”. After the sale if this land is agreed, the land plots ownership rights will be transferred to the Company, and the land use will be changed to “industrial”.

11.8.16. The Company is responsible for the land acquisition process. The Company buys land on a “willing buyer - willing seller” basis and follows principles of Ukrainian land law on land acquisition process.

11.8.17. A Livelihood Restoration Framework has been prepared as part of the Disclosure Package and will be developed into a Livelihood Restoration Plan.

Grievance Mechanism

11.8.18. The City has a grievance department which is responsible for Citizens Appeals. The City follows the Law of Ukraine On Appeals of Citizens (1996, amended 2016). According to this law, citizens can appeal either via personal appointment, hot line number or written letter.

11.8.19. A Grievance Mechanism will be implemented as part of the Stakeholder Engagement Plan during the construction and operation of the Project.

CONSTRUCTION

11.8.20. The Project could affect the local population in the following ways:

Land Acquisition/Use and Livelihood Restoration

11.8.21. Property and land owners located within the SPZ for the existing landfill and the indicative SPZs for the proposed landfill extension and MBT facility, may experience a reduction in the value of their land and structures due to the Project. Potential impacts on the land owners and house owners in the SPZ include restrictions on further construction of residential properties on all land plots within the SPZ area (applicable to the existing landfill facilities, the new landfill and the MBT facility). Based on the current Project footprint, the Project is not expected to cause any physical displacement of any individuals with legal or customary rights to lands.

11.8.22. The Project may require land acquisition for land for workers’ accommodation and storage areas. It is highly unlikely to cause any significant potential physical displacement or economic displacement given the availability of unused lands surrounding the local villages.

11.8.23. The Project will disrupt the work of the waste pickers during the construction and closure of the existing landfill site. Any potential impact associated with economic displacement during the closure/rehabilitation of the landfill will be managed through implementation of the LRF.

11.8.24. Overall, these effects are not considered to be significant with the implementation of the mitigation measures in the SEP and LRF during construction.

Employment and Economy

11.8.25. The Project could potentially create opportunities for direct and indirect employments and improve the local economy. These effects are considered to be beneficial.

If the Project results in the employment of foreign contractor(s), there could be potential impacts associated with labour influx and workers' accommodation location. However, these impacts would be mitigated through the Construction Accommodation Management Plan and a Community Health, Safety and Security Plan, which will be put in place prior to the start of construction activities.

11.8.26. These effects are not considered to be significant with the implementation of mitigation measures in the ESMP during construction.

Labour and Working Conditions

11.8.27. There are potential labour risks associated with child labour, forced labour and employment relations during construction. The current contracts with the waste pickers do not include any specific statements about forced and/or child labour, working hours, annual leave entitlements, or health and safety practice/policies.

11.8.28. The current lack of monitoring of salary and accommodation condition of the contract workers could breach the national labour law, and/or result in some construction workers being sourced illegally or provided with unsuitable accommodation.

11.8.29. The key impacts and effects related to occupational health and safety during the construction phase include the following:

- Traffic and plan movements;
- Release / mobilisation of hazardous substances and pathogen;
- Ground excavations;
- Stability impacts;
- Fuels and chemicals;
- Harmful plants; and
- Other construction risks such as work at height, work in confined spaces, etc.

11.8.30. During the construction period, a Labour Risk Assessment and regular audits will be undertaken to ensure the labour and working conditions for construction workers are in line with national and international requirements. During the operation phase, the Company will develop and implement a Supply Chain Policy and Procurement Management Plan. The LRF provides that alternative improved accommodation for waste pickers is provided away from the construction site. The effects are not considered to be significant with the implementation of these mitigation measures during construction.

Community Health, Safety and Security

11.8.31. The key impacts and effects related to community health, safety and security during the construction phase include the following:

- Increase in exposure to air, noise and odour emissions and impact on ground water;
- Increase in rates of vector-borne[6] and infectious diseases;
- Increase in rates of injury and mortality caused by accidents due to increased Project-related road transportation; and

[6] Vector: an organism that transmits a disease or parasite from one animal or plant to another.

- Reduced local security.

11.8.32. Overall, these are not considered to be significant with the implementation of a Community Health and Safety Plan during construction.

Community Infrastructure (including community access rights)

11.8.33. The Project construction workers' accommodation (presence of workers) could put a strain on local infrastructure such as electricity, water supply and the City hospital facilities. The Project could also deteriorate road quality during construction and restrict access rights.

11.8.34. Mitigation will be put in place including the establishment and development of temporary access roads and ensuring the Project self-sufficient in terms of resources (water, electricity, gas) to reduce any impact on local infrastructure. Workers' accommodation will be equipped with welfare, and medical facilities and that local transport will be provided for workers

11.8.35. The effects on community infrastructure are not considered to be significant with the implementation of mitigation measures during construction.

Community Cohesion and Well-being

11.8.36. The presence of construction workers from different backgrounds (Ukrainian or from other countries) and entrance of potential opportunists to the Project area may affect the social cohesion of the local community.

11.8.37. To address these concerns, consultation will be undertaken as well as the promotion of a grievance process. Construction workers will be informed of the local culture and social norms.

11.8.38. The effects on community cohesion and well-being are not considered to be significant with the implementation of mitigation measures during construction.

Vulnerable Groups Including Women

11.8.39. The Project is likely to impact on a number of vulnerable groups including: the waste pickers, women, people with limited education, people living on social benefits and land owners/users with no alternative income.

11.8.40. These effects will be mitigated through the implementation of the LRF which will include gender specific elements.

11.8.41. These effects are not considered to be significant with the implementation of mitigation measures during construction.

OPERATION

Physical Displacement and Economic Displacement

11.8.42. There are no impacts associated with physical displacement in relation to the operation stage. However, the need to comply with the national SPZ regulations in the project area, would result in the imposition of restrictions on the construction of permanently occupied residential properties in the SPZ. Land plots owners within the SPZ area will be able to continue with the construction of dachas, i.e. summer houses.

Employment and Economy

11.8.43. There will be local employment opportunities which has the potential to create direct jobs including 100-200 positions at the new MBT within a year during the operation stage. Other jobs created would include administrative and management jobs as well as technical engineers and operators' jobs for the operation of the MBT site. The improved facility could result in new talent moving into the area.

11.8.44. The Company will mitigate potential impacts associated with labour migration by ensuring that the Contractor is required to: locate workers' accommodation away from local residential areas and meet best international practice (IFC and EBRD); train migrant workers on local culture and traditions; and ensure that transport, welfare and medical facilities are provided for workers during construction and within their accommodation.

11.8.45. These effects are considered to be beneficial.

Labour and Working Conditions

11.8.46. The operational risk associated with child labour and forced labour, and supply chain is anticipated to be similar to the construction stage. However, it is anticipated that the impacts from the Project would be smaller due to lower number of workers and suppliers, and limited contract work compared to the construction stage.

11.8.47. Due to the closure and rehabilitation of the existing landfill, it is anticipated that the potential impact that the existing landfill has on local community and also workers' health and safety will be reduced.

11.8.48. The anticipated impacts and effects related to occupational health and safety for both the proposed MBT facility and the proposed landfill during the construction phase include:

- Fire and explosion;
- Health risk and disease;
- Hazardous materials;
- Plant and equipment;
- High risk activities; and
- Work near water.

11.8.49. These effects will be mitigated through the Company developing and implementing a Solid Waste Management Plan and Material Use Management Plan. The Company will also develop and implement Operational Environmental, Health, Safety Management Plan. Finally, the new facilities will be designed in line with EU regulations and best available techniques.

11.8.50. Overall, these effects are not considered to be significant with the implementation of mitigation measures during operation.

Community Health, Safety and Security

11.8.51. The Project includes the closure and rehabilitation of the existing landfill, and thus any impact that the existing landfill is currently having on the local community's health and safety is expected to be reduced.

11.8.52. The adoption of high standards for the proposed landfill site will limit the potential for the development and spread of resident populations of vermin and pests onsite.

11.8.53. Although the number of vehicles used in the operation of the Project are not currently known, it is anticipated that there will be an increase in the total numbers. The increase in vehicle numbers has the potential to increase the chance of traffic accidents.

11.8.54. A Transport Management Plan will be put in place during the operation of the Project to ensure a safe way of working is implemented

11.8.55. Overall, these effects are not considered to be significant with the implementation of mitigation measures during operation.

Community Infrastructure (including community access rights)

11.8.56. The operational effects of the Project on infrastructures will be significantly reduced as the construction workers would have left the Project area at the end of the construction phase. Monitoring of community infrastructure will be conducted to ensure quality of roads and other infrastructure is restored to pre-project standards, as a minimum. Access to dwellings, commercial buildings and community services must be maintained at all times. Therefore, these effects are not considered to be significant during operation.

Community Cohesion and Well-being

11.8.57. The rehabilitation process and establishment of the proposed landfill will improve the waste management infrastructure and will also improve the visual view of the Site. The positive effects (not significant) associated with the Project include the creation of jobs, improved infrastructure and community initiatives. Community awareness workshops and consultations with locals following the construction stage will be undertaken to ensure regularity in the consultations

Vulnerable Groups Including Women

11.8.58. The nature of the risks of the Project activities on vulnerable groups remain similar to the construction phase. It is anticipated that the impacts from the Project operations would be smaller due to construction workers leaving the area (i.e. no labour influx and associated disturbances), fewer vehicles mobilised and improved working and living conditions for waste pickers transferred to the proposed landfill.

11.8.59. These effects are not considered to be significant with the implementation of mitigation measures during operation.

MITIGATION

11.8.60. The mitigation measures required during the construction and operation phases are outlined in the ESMP and include:

Construction

- Stakeholder Engagement Plan;
- Livelihood Restoration Framework and Livelihood Restoration Plan;
- Employment Management Plan (including recruitment);
- Gender Policy;
- Construction Accommodation Management Plan;
- Employee Grievance Procedure and Register;
- Security Management Plan;
- Labour Risk Assessment and conduct regular audits during construction;

- Community Health, Safety and Security Plan (which will also include Community Complaints Procedure and Register);
- Transport Management Plan;
- Supply Chain Policy;
- Procurement Plan; and
- Occupational Health and Safety Plan.

Operation

- Stakeholder Engagement Plan;
- Livelihood Restoration Framework and Livelihood Restoration Plan;
- Solid Waste Management Plan and Material Use Management Plan;
- Operational Health and Safety Management Plan
- Community Complaints Procedure and Register;
- Employee Grievance Procedure and Register;
- Gender Policy; and
- Employment Management Plan (including recruitment).

11.9 MATERIAL RESOURCES AND WASTE

BASELINE

Materials

11.9.1. The Site is currently an operational landfill, so will have limited requirements for the consumption of construction or other materials.

11.9.2. The main materials typically required for construction of the building on the site will be bricks and cement. After a steep decline in 2008, the availability of building bricks and cement in Ukraine increased in line with the recovery of the construction sector in the Ukraine.

11.9.3. In Ukraine, steel production also suffered a steep decline around 2008. Between 2008-2014, however, the level of production increased and stabilised. In 2014, there was another steep decline. Between 2014 and 2019, steel production has stabilised, though at a low level (comparable to 1995-2000).

11.9.4. A geotextile membrane will be one of the resources used to close the existing landfill, and to line the base of the proposed landfill. Whilst no data is available on the national production, availability or stocks of this product type in the Ukraine, it would, by volume, be expected to comprise a relatively small proportion of the overall resources consumed on the Project.

11.9.5. Non-structural soil will also be used in the existing landfill closure, as part of the surface capping layer. It is expected that this resource can be found abundantly in-country.

11.9.6. The baseline information indicates that the main materials (by volume) that are typically required to deliver construction projects of this nature, are readily available in Ukraine.

Site Arisings

11.9.7. As the Site is an operational landfill, there is currently limited generation of site arisings.

11.9.8. A team of 20 to 60 Roma waste pickers work at the existing landfill (numbers vary throughout the year). The waste pickers work in shifts collecting plastics and other materials for re-use from the existing landfill. The waste pickers are employed by two private companies who are subcontracted by

Spetskomuntrans. The plastics and other materials are then baled (Figure 11-2) for onwards recycling / re-use.

Figure 11-2 - Plastic Picked and Baled for Onwards Recycling / Reuse

11.9.9. The current transfer, recovery and recycling rates and capacity in Ukraine are very low. In 2011, the State Agency for Investment and National Projects of Ukraine (Invest Ukraine) stated waste processing levels were between 5-8%, with only 15 waste separation lines, two incineration plants, and no waste processing plants in the country[7].

11.9.10. In Ukraine in 2016, only 5.8% of household waste was recycled; 2.71% was incinerated, 3.09% was sent to other recycling stations and 0.003% was composted. The vast majority (approximately 94%) was sent to landfill and other disposal sites.[8] This information indicates that the availability of transfer, recovery and recycling infrastructure in Ukraine is currently very low. Most arisings across all industries are not recovered and are (as a result) sent to landfill.

11.9.11. The City of Khmelnitsky's municipal wastes are disposed of at the existing landfill[9]. Other than the two organisations who operate waste picking activities at existing landfill, there is no other transfer, recovery or recycling of waste known to occur.

11.9.12. Accordingly, it is expected that any arisings that the Project generate during construction, and which cannot be used on-site in landscaping and other similar capacities, will be sent to landfill.

11.9.13. During operation, the Project is expected to improve the transfer, recovery and recycling capacity of municipal waste in Ukraine and the City of Khmelnitsky, therefore, would positively reduce in country disposal rates and work towards achieving the objectives of the National Waste Management Strategy which aligns with the circular economy principles and the waste hierarchy.

Waste

11.9.14. As the Site is an operational landfill, there is very limited waste currently generated; any minor quantities of waste produced would likely be disposed of on the landfill itself. The Site has accepted untreated waste since 1956 and is reaching maximum capacity.

[7] Global Recycling Magazine (2017). Ukraine Waste Management: Yet Dependent on Investments.
[8] Ministry of Foreign Affairs (2018). Waste Management in Ukraine: Opportunities for Dutch Companies.
[9] R&D Technological Institute of Urban Municipal Economy (2018). Feasibility study for solid municipal wastes processing facility construction (wastes sorting line) aimed to retrieve raw materials finished products from disposed domestic wastes.

11.9.15. In 2017, Khmelnitsky generated approximately 92,000 tonnes of MSW per annum; this is anticipated to increase to approximately 107,000 tonnes per annum by 2027. This is nearly all landfilled.

11.9.16. According to the official data on the (approximate) 5,500 landfills and other disposal sites in Ukraine, in 2016 almost 6% were over capacity and 30% did not meet national environmental safety standards. It is estimated that 2,000 ha (20 km^2) of additional land will be required for new landfills in Ukraine in the future. This shows that there is very limited landfill capacity remaining in Ukraine.

11.9.17. Within the City of Khmelnitsky, it is forecast that the annual generation of MSW will increase from 84,000 tonnes to 91,000 tonnes by 2028.

11.9.18. The Project will generate waste through construction which is likely to be landfilled at the Site. This will negatively impact the total landfill capacity in the country. During operation, the Project is expected to reduce adverse impacts on landfill capacity through the provision of the proposed MBT facility which will help recover valuable recyclable materials, and generate compostable materials, supporting the aims of the National Waste Management Strategy.

CONSTRUCTION

11.9.19. The construction of the Project will require the use of finite resources. Although use of sustainably sourced materials (for example recycled content) will be maximised, some adverse, permanent impacts will occur, resulting in the depleting natural resources and the degradation of the natural environment.

11.9.20. Site preparation and remediation will produce construction arisings (top soil, vegetation and other earth works), most of which will be used on-site, and any remaining material will be sent to landfill as a last option.

11.9.21. The effects of both material consumption, and the disposal of waste during construction are not considered to be significant, based on consideration of: the scale and nature of the construction plans, the measures to minimise disposal to landfill (regionally and nationally), and the proposed mitigation measures.

OPERATION

11.9.22. The ongoing maintenance requirements (including repair work) for the proposed landfill and the proposed MBT Facility, are expected to require the consumption of materials and waste generation that needs to be disposed of to landfill. However, the quantity of these materials and waste is forecast to be minimal and therefore effects are not considered to be significant.

11.9.23. The primary purpose of the Project is to improve waste disposal capacity through the provision of the proposed landfill and the proposed MBT Facility. The operational waste effects will be beneficial (not significant), as the new landfill and the MBT Facility will improve waste management practice and reduce MSW disposal rates in Ukraine.

MITIGATION

Construction

11.9.24. The construction mitigation measures include the implementation of the CESMP, incorporating a Site Waste Management Plan and Materials Management Plan.

Operation

11.9.25. No mitigation measures are required as no significant effects are anticipated during the operation phase of the Project.

11.9.26. The ESMP includes an OESMP and an outline Operational Waste Management Plan for the Project which will reduce waste in accordance with the principles in the waste hierarchy.

11.10 CLIMATE CHANGE

BASELINE

11.10.1. Greenhouse Gas (GHG) emissions occur constantly and widely because of human and natural activities, including energy consumption (fuel and power), industrial processes, land use and land use change.

11.10.2. The GHG assessment only considers the potential for the Project to result in additional or avoided emissions in comparison to the baseline situation. The baseline conditions therefore focus on those emissions sources subject to change between the baseline situation or scenario and the implementation of the Project.

11.10.3. Without the Project, MSW will still be produced in the City, and this is expected to be 108,000 tonnes per year by 2027. However, all this waste will be disposed of at the existing landfill which is already approaching maximum capacity. As such, in the future baseline emissions of 1,296,724 tonnes of CO_2e total are expected to be produced by the decomposition of waste at the existing landfill.

CONSTRUCTION

11.10.4. The Project has the potential to result in increases in greenhouse gas emissions associated with construction activities (such as manufacturing of materials and construction processes).

11.10.5. The total construction related GHG emissions has been calculated to be 309 tonnes of CO_2e; 271 tCO_2e for product stage (the products include asphalt and concrete[10]) as embodied carbon (approximately 87%), and 38 tCO_2 from the transportation of these materials to the Site (13%).

11.10.6. The effects of the Project during construction are not anticipated to be significant.

OPERATION

11.10.7. Throughout its operational life, the Proposed MBT Facility will generate emissions from the transport of waste to and from the facility, the use of fuel and power at the plant and the expected waste decomposition at the proposed landfill. There will also be a reduction in GHG emissions from the closure of the existing landfill, improvements to the biogas collection system as part of the closure of the existing landfill, and a biogas collection system for the proposed landfill.

11.10.8. Throughout its operational life, the proposed MBT Facility will generate emissions from the transport of waste to and from the facility, the use of fuel and power at the plant and the expected waste decomposition at the proposed landfill.

[10] Data on buildings, roads and utilities was not provided at the time of writing and so has not been included in the assessment.

11.10.9. GHG emissions per year have been calculated to be 1,421 tCO2e; 340 tCO2 from transportation of waste, 548 tCO2 from plant use, 414 tCO2 from power use and 119 tCO2e from emissions from the anaerobic digestion process. However, the expected decrease in waste sent to landfill, and the change in landfill type is predicted to save -100,094 tCO_2e per year.

11.10.10. Total GHG emissions during the operation of the Project are predicted to reduce in comparison to the 'no project' scenario, as such, the Project is anticipated to have a beneficial effect.

MITIGATION

Construction:

- Incorporate carbon reduction in the design:
  - Reduce the materials required for the construction phase of the Project e.g. through efficient design, minimisation of waste etc.;
  - Substitute construction elements for lower-carbon alternatives (e.g. using low temperature asphalt); and
  - Use efficient construction processes.
- Select and engage with material suppliers and construction contractors and consider their policies and commitments to reduce GHG emissions;
- Minimise energy consumption including fuel usage;
- Source materials locally to minimise transport distances; and
- Use of efficient plant and equipment.

Operation:

- The Project will be designed and constructed to increase the operational lifespan and minimise the need for maintenance and refurbishment;
- The Project will be designed and constructed to increase the potential for reuse/recycling of materials at end-of-life stage;
- Specify high efficiency mechanical and electrical equipment;
- The Project will be designed operated, maintain and refurbished using efficient approaches and efficient plant and equipment;
- Ensure the maximum amount of methane (CH_4 is a GHG), is captured, and
- When the proposed landfill reaches full capacity, the MBT Facility will then supply a different landfill, any subsequent sites will be within close proximity to minimise distance required to transport waste.

12 HOW WILL THE PROJECT MANAGE AND MONITOR PROJECT RELATED EFFECTS?

12.1.1. An outline Environmental and Social Management Plan (ESMP) has been produced for the Project, which contains all of the main mitigation identified. This will be maintained as a live document and will be a requirement of the Company and its contractors. Fulfilment of these ESMP commitments will be further monitored by the EBRD.

12.1.2. Finally, the detailed design and the construction contractors will be required to fully implement the requirements of the ESIA and the ESMP, and independent audits will be undertaken to ensure that these requirements are fully implemented.

13 STAKEHOLDER ENGAGEMENT PLAN (SEP)

13.1.1. A SEP has been developed with the objective of identifying key stakeholders and ensuring that, where relevant, they are informed in a timely manner of the potential effects of the Project. Stakeholders could be individuals and organisations that may be directly or indirectly affected by the project either in a positive or negative way, who wish to express their views.

13.1.2. To summarise the SEP:

- Describes public consultations and information disclosure requirements;
- Identifies all potentially affected groups and individuals;
- Provides a good understanding of the Project for those that may potentially be affected;
- Provides an overview of previous consultation / engagement activities;
- Establish a system for long-term communications between the Project and communities that is of benefit to all parties; and
- Identifies a formal grievance mechanism to be used by stakeholders (internal and external) for dealing with complaints, concerns, queries and comments.

13.1.3. The SEP will be reviewed and updated on a regular basis. If activities change or new activities relating to stakeholder engagement commence, the SEP will be brought up to date. It will also be reviewed periodically during Project implementation and updated as necessary.

14 FURTHER INFORMATION AND CONTACT DETAILS

14.1.1. Documents associated with the Project, inclusive of this ESIA Report can be requested from:

Contact Information	
Name	Ms Ksenia Kosiuk
Title	Head of Local Population Enquiries Department (Grievance Manager)
Telephone	+38 097 893 35 16
Address	29008, 1 Tolstoho Street, City of Khmelnytskyi, Ukraine
Email	Ksenia.Kosyuk@gmail.com
Website	http://khm.gov.ua/uk/content/zvernennya-gromadyan

14.1.2. A form for registration of grievances related to the Project is provided as Appendix A.

Appendix A

PUBLIC GRIEVANCE FORMPUBLIC GRIEVANCE FORM

Reference No:	
Full Name:	
Note: *you can remain anonymous if you prefer or request not to disclose your identity to the third parties without your consent.*	☐ I wish to raise my grievance anonymously ☐ I request not to disclose my identity without my consent
Contact Information: Please mark how you wish to be contacted (mail, telephone, e-mail).	☐ By Post: Please provide mailing address: _____ _____ _____ ☐ By Telephone: _____ ☐ By E-mail: _____
Language: Please mark your preferred language for communication.	☐ Ukrainian ☐ Other (Please specify) _____

Description of Incident or Grievance:	What happened? Where did it happen? Who did it happen to? What is the result of the problem?
Date of Incident/Grievance	
	☐ One-time incident / grievance (date _____) ☐ Happened more than once (how many times? _____) ☐ On-going (currently experiencing problem)

What would you like to see happen to resolve the problem?