

BUCHAREST GLINA WWTP PHASE II (ROMANIA)

Non-Technical Summary

JUNE 2017

1 Introduction

This document provides a non-technical summary of the environmental and social assessments undertaken of the Glina Wastewater Treatment Plant Phase II Expansion Project. It provides a succinct and accessible account for how the Project will impact upon the citizens of Bucharest, the community surrounding the WWTP and the local environment. It addresses both positive and negative impacts, and where potentially significant risks are identified, outlines mitigation measures proposed to minimise any residual impact. Such mitigation will be delivered through the development of appropriate environmental and social management plans, as details further in the Project Environmental and Social Action Plan (ESAP).

1.1 Project Overview

Bucharest has a population of some two million inhabitants and a combined sewerage system which collects both domestic and industrial effluent, as well as storm water, most of which is treated at the Glina Waste Water Treatment Plant (WWTP), located on the banks of the Dambovita River to the south east of the city. The WWTP was designed from the outset to be developed in two phases, and as a result the existing Phase I facility, which has been in operation since 2006, has a restricted capacity which limits treatment of wastewater to population equivalent (P.E.) of 864 thousand people.

This limited capacity has resulted in impacts on the social and environmental performance of the plant¹. As a result, the Municipality of Bucharest (MoB or the “City”) is now seeking to implement the Phase II expansion works which will enable the WWTP to treat a population equivalent of some 2.4 million people. The upgrade will also result in the production of some 500 m³/day of sewage sludge (at 67% water content) which is more than can be disposed of to land as a currently practiced. As a result, a new sludge incineration plant is proposed as part of the expansion with the ability to dispose of over 120 tonnes per day. In addition to these two elements (together the Glina WWTP Phase II Project) there are associated proposals to upgrade the broader sewerage system feeding the Plant to reduce ingress of groundwaters and therefore reduced loads on the WWTP.

The City has received EU Cohesion funding for the project and additional financing is now being considered by the European Bank for Reconstruction and Development (the “EBRD” or the “Bank”), specifically regarding the plant upgrade and incineration plant development. The Bank also financed the Glina Phase I WWTP in 2006.

1.2 Project Benefits

The project will have an overall positive social impact for Bucharest and will help meet basic citizen needs for a clean and safe environment, something which the existing under-capacity plant cannot guarantee. It will also provide a range of opportunities for the local economy regarding both direct (mostly temporary) employment and through supporting economic activities. The greatest improvements will, however, undoubtedly be with regards to community health and safety, including an expected decrease in odour and reduced levels of untreated waste-water entering the river systems.

1.3 Project Permitting and Commitments

The project has been subject to a regulatory Environmental Impact Assessment pursuant to EU EIA Directive 2011/92/EC and Romanian Law GD 445/2009, and an Environmental Agreement (EA) has been issued for the project Feasibility Stage (2012, updated in 2013). A Supplementary Environmental and Social Impact Assessment (SESIA) has also been undertaken to ensure that the Project meets the EBRD’s Environmental and Social Performance Requirements. The results of these studies are

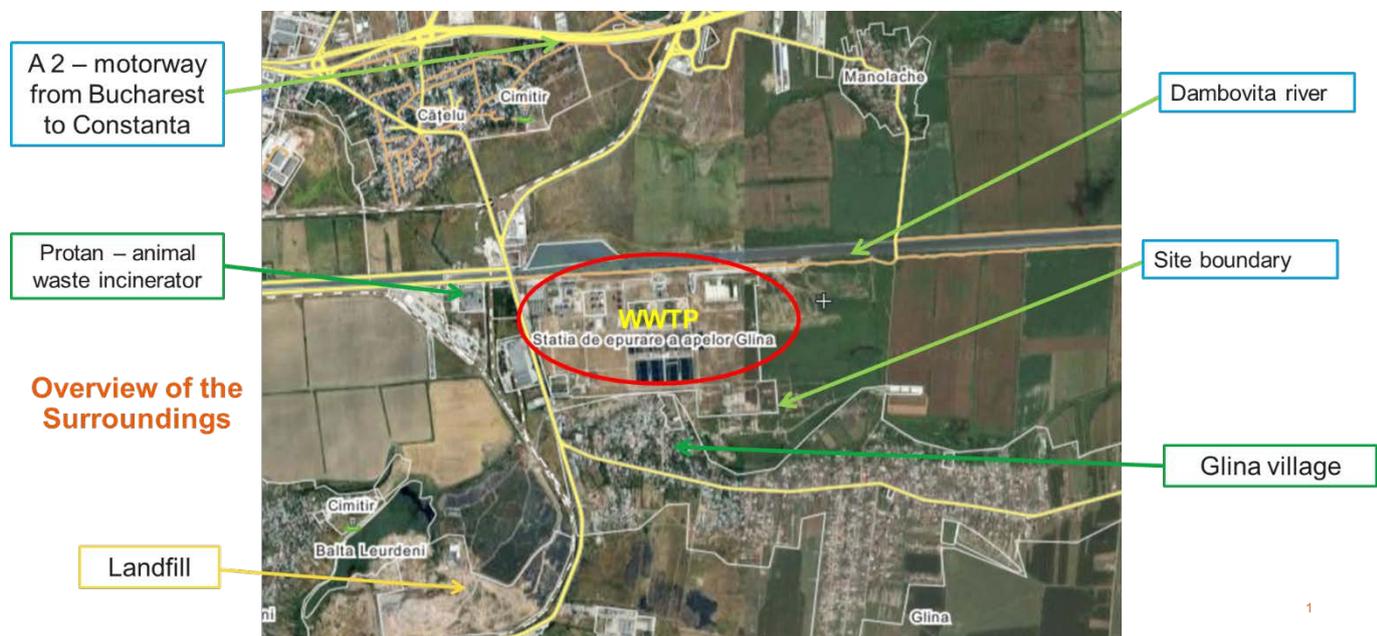
¹ The discharge of the Bucharest untreated wastewater was considered the main source of water quality degradation in Dambovita and Arges Rivers and as one of the major sources of pollution of the Danube River. The plant currently failing to meet the standards set by the European Commission for water quality treatment.

incorporated into this NTS, together with proposed mitigation for impacts including amendments to the design, construction and/or operation of the project. Prior to Project construction commencing, the Project Engineering, Procurement, and Construction (EPC) Contractor will submit detailed Project designs to the Ilfovy County Environmental Authority for approval. Such an approval will be required before the ultimate construction permits can be obtained. Appropriate environmental and social commitments will also be included within any loan documentation produced by the Bank.

2 Project Description

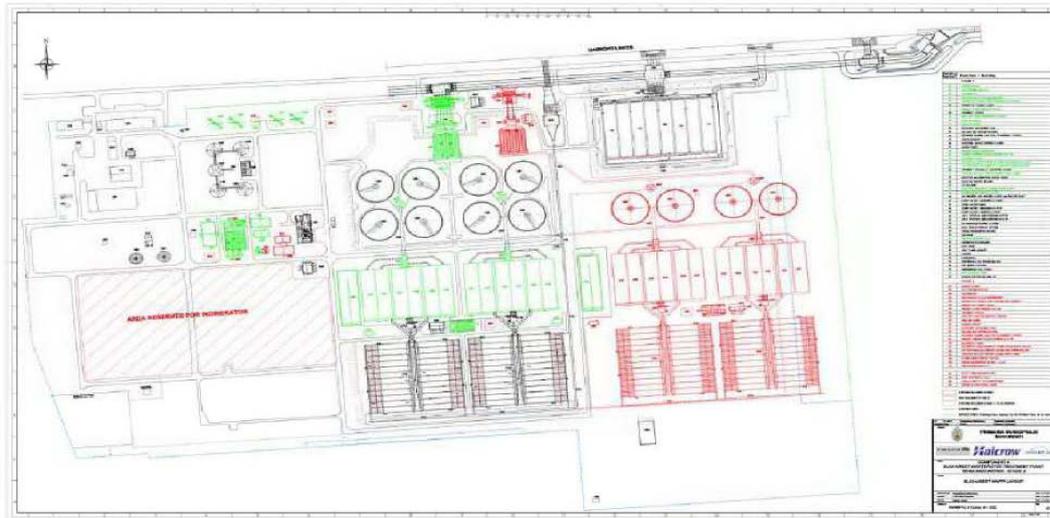
2.1 Physical Setting

The Glina WWTP is located south-east of the Bucharest, on the right bank of Dambovitza River, and next to the A2 highway. The site is within the Glina Administrative Unit (AU), which incorporates the three villages of Glina, Catelu and Manolache. Glina village is the closest to the WWTP Site and reaches up to its south-western boundary. The general location of the Glina WWTP Site and surroundings are shown in the figure below.



The General Urban Plan (PUG) identifies the WWTP site as located in as an Industrial Zone, despite the presence of the adjacent Glina village. Other surrounding landuses include the Dambovitza River canal to the north, pastures and other agricultural land to the east, the landfill “Ochiul Boului” to the south-west, a wholesale store for consumer goods, the pilot wastewater treatment plant and the PROTAN factory all to the west and a thermo-electric power plant to the northwest.

Within the existing Glina WWTP Site, 65 ha of the 114ha site have been reserved from the outset for the Phase II development which will connect directly to the existing Phase I facility. The new incinerator will be in the far south-west corner of the site as shown in the following figure.



2.2 Socio-Economic Setting

The WWTP site is situated within the Glina AU and the villages of Glina, Catelu and Manolache are located nearby. Of these the closest is Glina, and number of residential and commercial properties from the village are located next to the WWTP's southern border, with some houses only 10m from the fenced boundary. The new incinerator will be located relatively close to these properties, in the far south-west corner of the site.

Glina village has a total population of around 4000 people (2011 census data) of which the Roma population represent approximately 20%. The settlement has been located here since the WWTP was first built in 1985, but has expanded over time to abut the plant, with the closest houses reported to be mostly inhabited by informal waste recyclers who access the nearby landfill. The area faces several social challenges, and the WWTP site has reportedly been subject to both thefts and violent behaviour. As a result, ANB and MoB, built a concrete wall between the WWTP Site and the local community to prevent access to the Site (both people and waste) as well as a fence around the whole site. Security personnel also patrol the perimeter 24 hours a day and seven days a week.

Whilst Romanian legislation (Order no. 119/2014) normally requires a Sanitary Protection Zone (SPZ) of some 300 m to be created from a new WWTP site boundary (increased to 500m if an incinerator is present) such SPZs are intended to be used as a strategic tool when siting new projects and are not retrofitted to existing projects. Given that the WWTP was originally designated and constructed in 1985, and the houses have moved towards the plant since that time, such an SPZ is not considered to be applicable to the Glina site, and (despite the Public Health Directorate being on the permitting technical commission) no such requirement is included within the Project Environmental Decision. Should such an SPZ be imposed, however, even a 300m zone would clearly impinge upon the existing Glina settlement. In such an instance, implications for the Glina community would have to be carefully considered to avoid adverse social impacts, such as those that can be associated with mandatory community resettlement, which would really only be considered as an option of last resort .

2.3 Engineering Design

The final project design of the WWTP has yet to be confirmed, but the EPC Contractor will be provided with details of both the sewage volumes / loads to treat and the key environmental and social obligations that must be met to comply with the Environmental Agreement (EA), National and EU Regulations. A level of flexibility has been retained as to exactly how this will be achieved (e.g. number, size and dimension of tanks, screens, etc), but the processes will involve a combination of gravity and mechanical thickening of sludge, sludge digestion and dewatering (the latter in centrifuges) and incineration of residual sludge. This will require the installation of additional mechanical treatment facilities (including coarse and fine screens, grit chambers, grease removal and primary sedimentation); biological treatment facilities (using an activated sludge process) and secondary sedimentation.

Together these processes should remove 70% - 90% of pollutants at a flow rate of around 12 m³/s before the residual effluent is discharged (see the SESIA Report for further details).

The upgraded plant will result in some 3,300 m³/day of wet sludge, which will be dried to create around 500 m³/day dewatered sludge at a 67% water content (i.e. around 165 tonnes/day). This will be fed into the fluidised bed incinerator which will be designed, built and operated to meet the requirements of the EU Industrial Emissions (IE) Directive as well as the requirements of the EU BREF for Waste Incineration (2006). The incinerator will operate at a temperature above 850°C to ensure complete combustion of sludge and will include processes for heat recovery and energy efficiency. The process will ultimately create some 50 m³/d of ash (85 tonnes /day) for disposal. Given the potential for heavy metals and other hazardous materials to be present in the ash, disposal is likely to be an approved hazardous waste landfill, although this will be confirmed by appropriate laboratory analysis before disposal commences. Further details on the incineration and ash disposal processes, including alternatives assessed, are provided within the SESIA Report. At this stage, however, disposal of ash to landfill is considered to be consistent with Good Industry Practice, although this will continue to be reviewed through the operational life of the facility.

3 Potential Impacts and Proposed Mitigation

3.1 Assessment and Management of Environmental and Social Impacts and Issues (PR1)

The Project has sought from the outset to identify, manage and mitigate potential environmental and social impacts associated with both its construction and operation. A Project specific Environmental and Social Management System (ESMS) will be developed which will include both:

- Construction Environmental and Social Management Plans (CESMPs) to be directly applied by the MOB Project Implementation Unity (PIU) during construction works
- Operational Environmental and Social Management Plans (OESMPs) to be applied by ANB during operation of the facility.

During construction, the EPC contractors will also have their own ESMS and CESMPs in place which will ultimately deliver the commitments in the MoB CESMPs. Likewise, the OESMPs will ultimately be integrated into the existing ANB ESMS which will be expanded to include the Phase II facilities. In addition, a series of "Operations and Maintenance Management Plans" will be developed and implemented to ensure that WWTP elements, including the incinerator, are both appropriately operated and adequately maintained. The ESMS and its associated plans will also include appropriate approaches to monitor project impacts and to allow, if necessary, additional mitigation measures to be developed to address any issues arising. Such monitoring will include both management processes and wastes and emissions, and will cover both the wastewater treatment and the incineration processes. The results will be used to help ensure that no adverse environmental or social impacts arise from the project and will also be used to demonstrate compliance with legislation and the conditions imposed by the environmental agreement and permit / authorisation.

3.2 Labour and Working Conditions (PR2)

The Project will develop a specific labour and working conditions management plan, and the EPC contractor will be required to do the same. This will include appropriate capacity building to ensure that workers and managers are both aware and understand their obligations under national labour laws, PR2, existing contracts and the Labour and Working Conditions Management Plan; and have the capacity to deliver compliance (including management capacity, reporting / data gathering mechanisms, inductions and training for workers, and monitoring of performance). Contractors will also be required to have effective Grievance Mechanisms in place, accessible to all their workers and if required sub-contractors. The primary contractor(s) shall also have a policy that defines the responsibilities for the dissemination, implementation, monitoring and supervision of this/these mechanism(s).

3.3 Resource Efficiency and Pollution Prevention and Control (PR3)

Protection of Water Resources

Following the plant upgrade, final effluents will meet the requirements of both the EU Urban Waste Water Treatment Directive (UWWTD) 91/271/EEC and national legislation. This will include maintaining levels of Biological Oxygen Demand (BOD) of less than 25mg/l, Chemical Oxygen Demand (COD) of less than 125mg/l, Suspended Solids (SS) of less than 35mg/l, Total Nitrogen (TN) of less than 10mg/l and Total Phosphorus (TP) of less than 1mg/l. Achieving this will significantly improve the water quality of the River Dambovita downstream of the plant, especially as the WWTP effluent waters represent almost three quarters of the natural flow of the watercourse. This will also lead to a cleaner environment with reduced nuisances such as odours, floating refuse, unpleasant water colour; will increase the ecological value of the river and will reduce groundwater pollution. This in turn could increase water use for irrigation and recreation, with beneficial socio-economic effects. Given these improvements no further mitigation is required, although monitoring of effluent discharge will be undertaken to ensure the plant complies with its permits.

Odour

The Project includes specific design measures to minimise, contain and treat odour emissions. These include enclosure of key odour sources (screens, sludge receiving and storage areas, sludge feeding system and sludge dewatering plant) and installation of a specific ventilation system with wet air scrubbing and carbon adsorption to reduce smells. Use of anaerobic digestion and effective incineration of sludge will further eliminate odours. Despite this odour will always remain a perceived area of concern for a WWTP project, especially given the proximity of Glina village which has already led to many complaints for the Phase 1 works. Given the mitigation included in the WWTP design, however, the Project is expected to result in an overall reduction in odour levels at and around the site when compared to the current situation. An appropriate monitoring process will also be put in place to confirm the efficacy of these planned controls and allow subsequent amendments to operational design and/or practices should they be required. Positive results should also occur downstream of the plant as there will no longer be discharge of partially treated wastewater (with associated odours) into the Dambovita river.

Emissions from Sludge Incineration

The Project's Environmental Agreement requires that the incinerator will be designed, equipped, built and operated in such a way that the emission limits set out by IE Directive 2010/75/EU will be not exceeded and no adverse impacts to air quality are expected to result from these general incinerator emissions. Good International Practice (GIP) is that if long-term emissions are <1% of the long-term environmental standard; and short-term emissions are <10% of the short-term environmental standard, they can be considered insignificant. The regulatory EIA includes a dispersion study which only the annual process contributions for NO₂ (2.4%) SO₂ (1.9%) and Cd (6.9%) are greater than 1% of the relevant standard, and other emissions can be considered insignificant. For the remaining three pollutants, the guidance also states that they should be considered insignificant if their contribution, plus the background concentration, is less than 70% of the relevant limit value. Whilst NO₂ levels are expected to be close to the limit level (67%) under worst case conditions and will therefore be monitored, levels of SO₂ and Cd are low at 11% and 5% respectively.

In addition to general emissions, incomplete combustion of wastes in an incinerator has the potential to release partially burned hydrocarbons containing toxic organic compounds (TOCs). These have been associated with human health issues, and can be a cause of public concern. Such TOCs are however typically associated with incineration of municipal solid waste, rather than sewage sludge, especially as their formation is inhibited by the higher sulphur content usually found in sludge. The high temperatures (above 600°C) found in modern incinerators will also destroy dioxins and furans, whilst the removal of ash at high temperatures and the proposed flue gas treatment using activated carbon will remove any remaining. As a result, emissions of these TOCs are expected to be well below the EU Directive limit value limit of 0.1 ng I-TEQ/NM3. Heavy metals are also vaporised at the high combustion temperatures employed in incineration plants, and the use of a combination of electro-static precipitators (ESPs) for

particulate removal, and conventional emissions treatment (“scrubbing”) is expected to see between 78–98% of the metals removed from the flue gases. Residual stack emissions are therefore not considered to represent any residual risks to either human health or the environment, whilst the proposed 30m stack height is considered optimal to ensure effective atmospheric dispersion of any emissions from the incineration process without affecting ambient air limit/ target levels. At this stack height, there was no modelled exceedance of the limit values for NO₂ at any sensitive receptors, for any of the averaging periods even in the case of the cumulative impact of incinerator operation and background levels and under a worst case-scenario of maximum allowable emissions. Overall, therefore following this mitigation, no residual impacts are expected because of emissions from the Project incinerator. A robust operational air quality monitoring regime will be employed to confirm that EU standards are met and the monitoring programme required in the EA will be reviewed and complemented, if considered necessary.

Greenhouse Gas (GHG) Emissions

Whilst the upgraded WWTP requires substantial amounts of energy for key operations such as the water and sludge pumping, aeration of activated sludge basins, sludge dewatering and incineration, it also offers possibilities to create energy. Through burning biogas to create electricity, producing power with the outlet/steam turbines using the high temperature flue gas and reusing incinerator gases to preheat sludges it is expected that the plant can reduce its net electricity consumption by around 80%. As a result, even with the upgraded WWTP in operation, annual GHG production will be less than 25,000 tonnes of CO₂ equivalent and as such the Project will not be required to provide an emission inventory and/or plans for annual reporting.

Noise

The Project EA includes a requirement that noise levels at the site boundary must be below 65 dB(A), the limits specified in STAS 10009/1988 for industrial areas. To achieve this, it prescribes several noise reduction measures, including the use of soundproofed buildings for key equipment such as centrifuges. Where practical, given the presence of Glina village immediately to the south of the site, work will also be undertaken to bring boundary noise levels down further, although existing levels in the village already exceed residential noise levels with levels of 45-55 dB(A) recorded in the Glina and Popesti Leordeni villages, and levels of 60-65 dB(A) near the main roads. In accordance with the EA, the project will also plant a curtain of tall trees at the site boundary bordering Glina village, which may help further reduce noise levels here.

Hazardous Materials / Waste

The existing WWTP currently separates out hazardous materials and disposes of them using specialist contractors. Whilst the Phase II operations will introduce new hazardous materials (i.e. incinerator wastes) the existing updated Hazardous Materials / Substances Management Plan will be updated to include identification of all hazardous materials / substances used in the treatment process as well as definition of adequate measures to manage all hazardous materials / substances (including quantities, storage on site, adequate training for handling these substances etc). All waste that will be generated because of the incineration process, including ash, will also be considered hazardous (unless appropriate testing demonstrates otherwise) and will need to be managed in accordance with this plan. An updated Waste Management Plan will also be developed for construction and operation of the facility.

3.4 Community Health and Safety (PR4)

Overview

The proposed Project is expected to have an overall beneficial effect on local community health and safety, although the WWTP itself is understood not to be the main source of pollution affecting these communities. Instead the varied industrial activities of the area, including the landfill, power plant and animal waste incinerator, are considered greater sources of pollution as well as the nearby major roads. The Project should however address any existing health issues associated with sludge and wastewater handling and is therefore expected to have an overall benefit for the local community.

Traffic and Road Safety

Traffic and road safety issues are currently addressed through the Operational Plant Safety Management System. A baseline Traffic Study will be undertaken for the Project to gain a better understanding of existing traffic conditions, and a Traffic and Road Safety Management Plan developed and implemented (both construction and operations). Operational traffic is however expected to decrease as levels of ash to be transported will be less than the current transport of sewage sludge.

Emergency Preparedness and Response

The existing site has an emergency preparedness and response process in place managed through the operational safety management system which is OHSAS 18001 compliant, which will be updated because of the Project to deal with the increased size and nature of the operations. In addition, as the WWTP Site falls under SEVESO Directive provisions regarding the storage capacity for the biogas generated the related emergency management and response documentation will need to be reapproved by relevant authorities following the Phase II works. This will include an update of major accident scenarios to ensure that appropriate risk mitigation measures are in place especially regarding the inhabitants of Glina village. Sludge incinerator safety provisions will also be incorporated into the design compliant with BAT as described in the BREF for Waste Incineration (2006) and an updated Emergency Preparedness and Response Plan will be developed, considering the specific risks associated with the new incineration facility.

3.5 Land Acquisition, Involuntary Resettlement and Economic Displacement (PR5)

The proposed Project will be developed within the footprint of the existing WWTP and all areas necessary for project implementation are owned by the local authorities and have been declared available exclusively for this project. As a result, no involuntary resettlement or economic displacement situations are expected to occur during project construction or implementation, although there is the potential for some temporary disturbance during the upgrade of the associated sewage collectors' rehabilitation. In such instances MoB (through the construction companies) will seek to reduce any adverse impacts through appropriate mitigation such as effective communications and/or provision of alternative access to areas of public interest and local business. A Temporary Land Acquisition Procedure will be developed and implemented to manage any such situations.

3.6 Biodiversity Conservation and Sustainable Management of Living Natural Resources (PR6)

The project is not expected to have any adverse impacts on Biodiversity and Nature Conservation and will be developed entirely within the footprint of the existing WWTP which is a designated "Industrial Area" with no natural habitat present. Indeed, aquatic habitats downstream of the site should see a beneficial impact because of the improved quality of the WWTP effluent. Whilst there are two Natura 2000 wetland present in the broader vicinity of the WWTP site (Lacul și Pădurea Cernica and the Grădiștea-Căldărușani-Dridu, some 3km and 10km away respectively) neither is expected to be affected by the Project.

3.7 Cultural Heritage (PR8)

No objectives of cultural public interest are in the surroundings of the project area and no significant impacts on cultural heritage are expected given that all construction works will be carried out in areas already disturbed. A "Chance Finds Procedure" will however be developed for the Project and implemented should it be required.

4 Information Disclosure and Stakeholder Engagement (PR10)

4.1 Project Disclosure

The Project has strong visibility in the media, and is one of the most important environmental projects to be implemented in Romania so far. As such, stakeholder engagement is a sensitive aspect which the MoB acknowledges as being very important to be carried out in an appropriate manner.

The Regulatory EIA has been subject to considerable public disclosure since it was first developed. This has included making the 2012 EIA Report available to the public on the Bucharest Regional Environmental Agency (REPA) website, the Bucharest Mayor website, and at the City's headquarters as well as a public debate of the EIA Report in 2012. A Technical Review Committee (CAT) was also consulted in all the stages of the regulatory EIA procedure (i.e. screening, scoping and review of the EIA Report) resulting in the Environmental Agreement (EA) which was issued in 2012 and updated with appropriate announcements in 2013.

A broader Project Communication Strategy was also developed in 2013 with associated annual Action Plans based on the strategic objectives of:

- awareness raising of the population at large on the importance of wastewater treatment and the environmental benefits envisaged to be achieved via this project;
- informing people about the tariffing policy and the way this will change when the project is completed;
- informing people about the project impacts in general, and the positive impacts;
- informing people about the construction works that will occur during the project implementation and their impacts, such as traffic restrictions.

The site operator has also carried out several actions aimed to strengthen public dialogue and in 2016 launched a rebranding campaign to promote all the services it offers. The company, now called Apa Nova – The Bucharest Waters Company (Apa Nova – Compania de Ape ANCAB) organized the first public debate on utilities in Romania, with more than 1500 participants and is intending to keep the public dialogue an open process and is taking measures to ensure the transparency of its services to the public.

In March 2017, several Romanian bloggers visited the WWTP and published very positive reviews on social media.

An updated Stakeholder Engagement Plan (SEP) has now been developed and is provided as a separate document.

4.2 Project Grievance Mechanism

The MoB has its internal grievance mechanism that allows people to address complaints and suggestions for any aspect related to their activities via:

- direct meetings with the mayor, vice-mayors and other key persons in the municipality.
- via phone – anybody can contact the representatives of municipality at the phone numbers that are available on their website - http://pmb.ro/contact/pmb/pmb_telefoane.php. At this link, the municipality presents the phone number of each department.
- via municipality website – a grievance template is available on municipality webpage at <http://pmb.ro/contact/petitie/petitie.php>
- via submitting in writing complaints directly at the municipality offices.

At the project level, a dedicated Grievance Mechanism will be developed and implemented prior to the start of the Construction Phase. This shall include adequate procedures to document all the project-related complaints or suggestions within a grievance register.

