Non-Technical Summary:

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE PROPOSED NIKOPOL BIOMASS CHPP, BULGARIA

October 2009

Prepared for:

Prepared by:
FOREWORD
Enemona SA is proposing to construct and operate a combined heat and power plant fueled by biomass in the municipality of Nikopol in northern Bulgaria. This document provides a Non-Technical Summary (NTS) of the Environmental Impact Assessment (EIA) and Supplemental Information Report that were prepared for the project. The document describes in a non-technical manner the proposed project and presents the major findings of the EIA and the Supplementary Information Report. In addition, this NTS describes actions that will be taken to prevent or reduce the effects on the environment or people during project construction and operation. The NTS will be used during public consultations that will be conducted in accordance with Bulgarian law and the best international standards.

The Bulgarian EIA and associated documents were disclosed and made available to the public on the Internet at www.enemona.com, www.riew-pleven.eu on 24 September 2009. On that date, Enemona also placed advertisements and announcements on local radio and television and in the Nikopol newspaper. This NonTechnical Summary and the Supplemental Information Report, including the Public Consultation and Disclosure Plan, were made available after 14 October on the Internet sites shown above. Public comments will be accepted in writing for the Bulgarian law EIA through 1 December 2009. In addition, there will be two public meetings to receive comments on 1 December and one in the Nikopol municipal at 10am and one at the Cherkovitsa municipal building at 2pm.. EBRD posted the NTS and the Public Consultation and Disclosure Plan on its website www.ebrd.com on 5 December; Enemona will receive comments for 60 days, until 8 February. Copies of all documents may also be requested for review from the following persons:

<table>
<thead>
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<th>Mr. Plamen Gechevsky</th>
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<tbody>
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Any written comments on the project and on the Bulgarian EIA, Supplementary Information Report, and NTS may be submitted to Mr. Plamen Gechevsky at the address above, or to Regional Inspectorate of Environment and Water in Pleven (Pleven RIEW or Regional Inspectorate). Comments can also be made at the two public discussion meetings on 1 December. Comments made after 1 December should be made to Mr. Gechevsky. The time and place of the meetings was announced on television and radio, in the newspaper, and on the websites of Enemona (www.enemona.com) and Pleven RIEW (www.pleven-riew.eu).

INTRODUCTION AND BACKGROUND
Enemona SA, a Bulgarian engineering company, plans to construct and operate a combined heat and power plant fueled by agricultural biomass (straw) in the Nikopol municipality in northern Bulgaria (Figure 1-1). Initially, the plant would only generate electricity, but future plans would allow the plant to provide hot water to the town of Nikopol and/or Cherkovitsa village, and steam to an industrial facility.

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1 Figure numbers are from the Supplementary Information Report and are not in order.
Proposed biomass CHPP and immediate vicinity
Nikopol, Bulgaria

Figure 1-1
Enemona SA is a publicly traded engineering and construction company with headquarters in Sofia and Kozloduy. The company has a number of project offices across Bulgaria. Since 1990, the company has operated in the fields of industrial and residential buildings construction, civil engineering, conventional and nuclear energy, ecology, energy efficiency and renewable energy sources. Among important Enemona projects are the reconstruction and modernization of unit 5 and unit 6 at the Kozloduy Nuclear Power Plant, various projects in Maritsa-East Thermal Power Plants Complex, Sofia airport, the reconstruction and modernization of the Court of Law building in Sofia, and many others. The company has also completed several large-scale projects in the cement and chemical industries. At present, the company employs more than 2,800 personnel, including qualified and experienced engineers and specialists in a number of industrial fields.

In 2007-2008, Enemona SA initiated development of a new renewable energy project, a 46-MWth biomass-fired combined heat and power plant in Nikopol municipality. The primary fuel will be agricultural waste (straw) collected from farmers within 100 kilometers of the plant. The figure on the right shows a conceptual drawing of such a plant.

Enemona SA has approached the European Bank for Reconstruction and Development (EBRD) for co-financing of the plant. EBRD requires that projects it supports be evaluated in an environmental and social impact assessment (ESIA) that assesses all potential environmental and social impacts associated with project construction and operation. Bulgarian law also requires an environmental impact assessment, which Enemona has prepared and submitted to the Pleven RIEW. In addition, EBRD requires that an ESIA meet its own requirements as well as those of the European Union. A Supplementary Information Report was prepared to meet those standards, including an evaluation of impacts from the straw collection program and carbon emissions.

This Non-Technical Summary describes the findings of the EIA and of the Supplementary Information Report, including the potential impacts on the environment and people, and actions that will eliminate, reduce, or mitigate those impacts.

**PROJECT PURPOSE AND NEED**

During the last decade, the EU has actively worked toward reducing the effects of climate change and establishing a common energy policy. As part of this policy, during the EU Summit in March, 2007, the European Heads of State or Governments agreed on binding targets to increase the share of energy that comes from renewable sources. In order to achieve the political objectives for renewable energy declared at Summit, the European Commission has proposed a directive setting national objectives for Member States for renewable energy. The Directive requires that the share of renewable energy resources of increase to 20 percent within the whole EU by 2020. To meet this common target, each Member State, including Bulgaria, needs to increase its production and use of renewable energy in electricity, heating and cooling, and transport. Bulgaria is approaching its target for having renewable energy sources provide 16 percent of electricity production by 2010. Large-scale hydropower is currently the main source of renewable electrically energy in Bulgaria, but its technical and economic potential is already fully exploited. Good

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opportunities exist for solid biomass, since 60 percent of land is agricultural and about 30 percent is forest cover.

Under a new law approved and signed by the Government of Bulgaria on June, 19, 2007, the Government is taking responsibility for a 12-year period of mandatory purchase of energy generated from renewable energy sources. The public utility company and the end suppliers, respectively, must purchase the entire quantity of energy generated from nearly all renewable and alternative energy sources at preferential prices during that period. Another law is foreseen for 2011 that will address market mechanisms for encouraging production of electricity and heating power from renewable energy sources. In addition, to promote renewable energy sources, Bulgaria is currently implementing the Bulgarian Energy Efficiency and Renewable Energy Credit Line (BEERECL) developed by EBRD, under which renewable energy projects are eligible for a 20 percent grant. Loans worth more than 12.8 million Euros have already been granted.

Nikopol Biomass CHPP project will become one of the first renewable energy source projects using biomass in Bulgaria, and this will promote the newly adopted National Renewable Energy Sources development program.

**EBRD AND EU ENVIRONMENTAL REGULATORY FRAMEWORK**

The development of the EIA and the Supplementary Information Report, including the environmental and social action plan (ESAP) and environmental and social monitoring program (ESMP), were guided by:

- Bulgaria Environment Preservation Act of 2002, as amended 2003 (which requires compliance with many other Bulgarian laws concerning air, water, soil, etc)
- Bulgarian Ordinance on the terms and procedure for making environmental impact assessment of investment proposals for construction, activities and technologies.
- Bulgaria Biological Diversity Act of 2002.
- IFC Environmental, Health & Safety General Guidelines (April 30, 2007), including wastewater and ambient water quality, waste management and hazardous materials management, noise management, occupational health and safety, and construction and decommissioning guidelines.
- IFC Environmental, Health & Safety Guidelines for Thermal Power plants, December, 18, 2008
- EBRD Environmental Policy, July 2003
- EBRD Sub-sectoral Environmental guidelines, “Building and construction activities”
- EBRD Environmental, Health & Safety Audit Protocol, May, 2003
NON-TECHNICAL SUMMARY:
Environmental and Social Impact Assessment of the Proposed Nikopol Biomass CHPP, Bulgaria


SCOPE OF THE ESIA AND METHODOLOGY
Discussions with stakeholders took place throughout the EIA process. It has included consultations local communities, with local and regional authorities, and both international and Bulgarian nongovernmental organizations (NGOs). Consultations with project stakeholders are described in the Public Consultation and Disclosure Plan that is part of the Supplementary Information Report.

Potential impacts were evaluated for project construction and operation by their significance and magnitude (minor, moderate and major), taking into account the severity of the impact and the likelihood of its occurrence. Based on the evaluation of potential impacts, appropriate measures to prevent, reduce, control adverse impacts (known as mitigation measures) were formulated and specified in the Environmental and Social Action Plan and the Environmental and Social Management Plan, which are presented in the Supplementary Information Report and summarized in this NonTechnical Summary.

PROJECT DESCRIPTION
CHPP Nikopol JSC will manage and supervise the development, construction and operation of the proposed Nikopol biomass CHPP plant. CHPP Nikopol JSC is a joint-stock company wholly owned by Enemona SA. CHPP Nikopol JSC has retained the services of EQE Control Company to assist in project supervision. EQE Control OOD, established in 2000, is a special company for mandatory supervision of works as per Bulgarian requirements.

Straw collection and handling will be performed by another Enemona SA subsidiary, AgroInvest Engineering SA. The company will be responsible for all issues associated with buying, collecting, storing, and transporting straw, and for the three straw storage areas.

The Project will include five key facilities, whose locations are shown on Figure 2-1:

- The combined heat and power plant.
- A vehicle repair/workshop and maintenance facility at Belene.
- Three areas to store straw, which will be located near the villages of Gulyantsi, Asenovo and Novachene.

The Nikopol combined heat and power plant will be located about 3 kilometers west of Nikopol and 1.8 kilometers east of Cherkovitsa (Figure 2-1). The plant will occupy land that covers about two hectares. The site lies between the main road and the Osam River on the south and north, and between a petrol station and open land on the west and east. A small part of the site is within the Nikopol Plateau bird protection Natura 2000 protected area and the site is near the Persina habitat protection Natura area.
Figure 2-1: Proposed biomass CHPP, straw storage areas, and base camp within the straw collection area.
The plant will have a straw storage area, a boiler to burn straw and generate steam, turbines to generate electricity, transformers and other electrical equipment, and a transmission line to conduct electricity to the nearby substation. In addition, there will be air pollution control equipment to reduce the amount of pollution, a stack 35 to 45 meters high, water treatment systems, and an office and support facilities. During operation, the plant will take water from the Osam River and treat it so it can be used for cooling water and by workers. After use, water will be reused or treated and discharged back to the Osam River. A fence or wall 2-3 meters high will be constructed around the plant site, and there will be no construction within five meters of the site boundaries, which will provide room for a greenbelt of trees or other vegetation around the site. (This plan was adopted by the Expert Council on Territory in the municipality of Nikopol in July 2009.) In the future, the plant may add pipes to carry hot water to a district heating system in Nikopol and/or Cherkovitsa, and also may add pipes to carry steam to the cardboard factory or another industrial facility.

The workshop and maintenance facility (also known as the “base camp”) will be in the town of Belene. This facility will serve as a base for manufacturing, servicing, and repairing non-standard equipment and also will serve as the maintenance and repair facility for all vehicles, tractors and other agricultural equipment, and other equipment. The facility will include an administrative building with a parking lot for 72 vehicles, workshops for motor vehicles, spare tools and parts for engines, two assembly workshops, machine and vehicle repair shop, and a workshop for corrosion protection. In addition, the facility will include water purification equipment, mechanical workshop, welding workshop, and indoor garage. The Belene facility will also have warehouse space for storing batteries, tires, fuels and lubricants, machinery and equipment, and a large warehouse for agricultural machinery and equipment spare parts. The layout is shown on the figure above.

Straw will be stored at three straw storage areas, near Gulyantsi, Novachene, and Asenovo. Straw will be collected from farms in Bulgaria within about 100 kilometers of the plant. Figure 2 shows the area from which straw will be collected. The storage area near Gulyantsi is about 20 kilometers from the plant and will cover about 13.6 hectares. It can store about 65 000 to 70 000 tonnes of straw. The area near Asenovo is about 18.5 kilometers from the plant and covers about 4 hectares. It can store about 20 000 tonnes of straw. The area near Novachene, at Farmers Union “Maren” LLC, is about 22 kilometers from the plant, covers about 5-6 hectares, and can store about 25 000 to 35 000 tonnes, of which about 10 000 tonnes will be stored outside and the remainder in an existing building.

A total of 60-120 medium-duty and heavy-duty tractors will be used for straw harvest. A total of 60 to 120 farm tractors and 30 to 60 baling machines will be used to put straw in bales about 2.4 x 1.2 x 1 meters that each weigh 300 to 400 kilograms. Straw cutting and baling would occur over about 45 days in late summer and fall. Work would go on for 8 to 12 hours a day, 7 days a week, during dry weather. Straw bales will be transported from farms to storage areas by tractors pulling small trailers (for farms within 10 kilometers of storage) and by trucks with trailers. Each year, Enemona SA will purchase and store about 125 000

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tonnes of straw, which is about 55-60 percent of all the straw that will be available. During the 45-day harvest period, there will be about 88 loads of straw delivered to each storage area each day, or about one truck or tractor arriving and departing every 3-5 minutes during daylight hours.

The plant will burn about 300 tonnes of straw per day. A storage facility at the plant will be able to store enough straw to supply the plant for about four days. Straw will be transported from the storage areas to the plant in large trucks and semi-trailers each day, with a total of 21 loads delivered each day, almost one per hour.

Construction of the plant, maintenance facility, and three straw storage areas will require about 40-50 workers. Much of the construction workforce will probably be recruited from nearby areas (Cherkovitsa village, Nikopol town, Belene town, and the villages of Gulyantsi, Asenovo and Novachene. The plant site will be raised about 0.5-1.0 meters above the existing ground level to protect against flooding. In addition, a levee will be constructed around the north, east, and west sides of the plant site to protect against flooding of the Osam River.

The plant will operate for about 25 years. It will burn about 300 tonnes of straw per day, for a total of 110,000 tonnes per year (15MWel). A schematic of the plant’s operation is shown on the figure to the right. If the plant produces steam for sale, it will be able to produce up to 7 tonnes of steam per hour (up to 9.37 MWth). If hot water is supplied to Nikopol and/or Cherkovitsa, the plant can supply up to 11.2 MWth. The fuel will be agricultural waste (straw) as well as rape straw. The plant also could accept up to 20 percent wood chips.

Burning straw will leave behind a small amount of ash. Ash in the gasses that leave the boiler will be collected by air pollution control equipment, and “bottom ash” will fall to the bottom of the boiler. The plant will produce about 7,500 tonnes of ash each year. Ash will be stored at the plant for a short time before being carried to the Nikopol municipal landfill. Enemona SA is working with the Ministry of Agriculture to allow the ash to be applied to the land for nutrient or mineral value.
POTENTIAL ENVIRONMENTAL AND SOCIOECONOMIC BENEFITS

One of the major potential environmental benefits of the project is the production of electricity with much less air pollution than would come from a plant that burned a fossil fuel such as coal – compared to coal, this plant would emit less than 2 percent of nitrogen oxides and sulfur dioxide. In addition, emissions of greenhouses gasses such as carbon dioxide (CO₂) would be much lower: carbon emissions from an equivalent 46.2MW lignite/coal-fired plant would be over 443 120 tonnes per year, not including carbon emissions from mining and transportation. The Nikopol CHPP would be more than 440,000 tonnes per year lower. In addition, collecting straw from farms will reduce straw burning in the fields, and avoid those adverse impacts on local air quality.

Among potential socioeconomic benefits of the project would be the increase in employment opportunities for laborers, including construction, transportation, vehicle maintenance, plant operation, and seasonal harvest labor. The project would increase the amount of electrical power in the Bulgarian grid. Another benefit would be the creation of a new market for a former waste product, benefiting both farmers and power users while remaining carbon-neutral and compliant with Bulgarian and EU regulations. Future benefits could include providing hot water for heating municipal buildings and factories and producing steam for local industry. Overall, the Nikopol biomass CHPP can increase the reputation of Bulgaria as an environment-friendly EU member state and serve as a showcase for biomass-fuelled power plants that can be replicated throughout the region.

POTENTIAL IMPACTS AND MITIGATION MEASURES

Environmental impacts during construction

Construction of the CHPP Nikopol biomass power plant and its support facilities will cause environmental disturbances typical of construction projects, including traffic congestion, noise, dust, and gaseous emissions of construction equipment and vehicles. These disturbances will be temporary and mostly confined to the construction site and its immediate vicinity. Impacts will be minimized through good construction management practices and construction methods that avoid or reduce environmental disturbances. Measures to prevent, reduce or control the potential impacts are shown in Table 6-1 of the Supplementary Information Report and in Table 2 below.

Air quality. The impacts on ambient air quality during construction period will be minimal and temporary. The major sources of air emissions during construction will be combustion emissions from vehicles and heavy construction equipment; and fugitive dust generated from vehicle movement over bare soil and soil excavation. All vehicles and equipment will be maintained in good repair, which will minimize emissions. If necessarily, dust will be controlled with water sprays. Together, these will make impacts on air quality very minor.

Noise. Construction noise will be created by vehicles, heavy equipment, and some construction activities such as erection of equipment and percussion pilings. The only people who may be exposed to noise would be travelers on the road, people at the petrol station, and possibly people at the small hotel on the opposite side of the road. There are no residential areas near the plant site and construction will take place only in daylight hours. No specific noise control measures will need to be applied other than those that apply to all construction sites. The vehicle repair and maintenance facility at Belene is bordered by residential buildings and military buildings. During the construction of this base camp, the 24-hour average or daytime average noise levels at the residential areas nearest to the site is expected to be less than 70-80 dB(A) and so no additional controls are needed. Similarly,
the only noise that would be generated by straw storage construction would be from vehicles, and this would be confined to the sites. Overall, noise impacts would be minor and very local.

*Surface water.* During construction of the plant, minor and temporary impacts on surface water may occur from storm water runoff into the water ditch that runs on the west side of the site, and possibly into the old Osam River channel on the north of the site. During early stages of construction, placement of the levee on the west, north, and east sides of the site, site grading, and excavation works could add considerable silt and silty material loads into surface runoff from the construction site, thereby contributing to an overall increase in total suspended sediments loads in the Osam River and the former channel of the river. Implementation of storm water runoff controls and spill prevention control plans will ensure that potential impacts of construction activities on surface water are negligible or minor.

*Soil and groundwater.* There could be local soil and shallow groundwater contamination if there are accidental spills of chemical and fuel at the construction site(s). Appropriate mitigation measures will significantly reduce the risks of local soil and groundwater contamination from fuel and chemical spills. These would including precautions when using chemicals or fuel, not using them near water, using them over impervious surfaces, and having cleanup materials nearby.

*Construction and sanitary waste management.* The construction of the plant, base camp, and three straw storage areas will require about 40 to 50 workers. Temporary toilets to store sanitary wastes will be provide on each site. Other solid waste and construction debris will be collected on-site for further disposal in appropriate locations. Any worker camps, including kitchen and canteens, will be maintained as required by Bulgarian law. All waste management and sanitation requirements will be described in construction contracts. With these mitigation measures, sanitary and other wastes will not contaminate the environment.

*Ecosystems, Flora, and Fauna.* As noted above, the plant site is within the Nikopol Plateau bird habitat Natura 2000 area and a small part also lies within the Persina habitat Natura area. In addition, the Novachene straw collection area is within the Nikopol Plateau bird habitat area. However, the plant site was previously used for industrial purposes (asphalt or cement fabrication), the Novachene straw storage area has a farm building that is still being used, the other two straw areas have been or are cultivated with crops or grass, and the Belene base camp is in a town. Thus, all have been extensively disturbed and do not support native vegetation. Clearing the plant site will require removal of vegetation, including where it has begun to recover from past activities. Similarly, clearing and preparing the straw storage areas may require some shrubs and trees to be removed and will trample the existing grass cover. Because these areas have been disturbed in the past and/or the present, the new construction will not affect any pristine areas, or areas of special concern. In addition, only a very small proportion of the Nikopol Plateau and Persina Natural 2000 areas and impacts would be affected, leaving the vast majority of these areas unaffected.

*Environmental impacts during operation*

*Air quality.* Emissions from the combustion of straw in the boiler furnace will be the key environmental issue during operation. Although the specific boiler and air pollution control technologies have not been selected, adoption of the Best Available Technologies (BAT) will ensure the plant emissions meet EU and Bulgarian limits for particulate matter and other air pollutants. Expected emissions and emission limits are shown in Table 1.
Table 1  Estimated emissions during CHPP Nikopol power plant operations

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Maximum emissions required to be met by EPC contractor air (mg/Nm3)</th>
<th>EU Directive 2001/80EC, for new biomass power plants mg/Nm3</th>
<th>National Bulgarian limits for thermal plants Appendix 7, Art.21, paragraph 1 from Ordinance N1/2005 (mg/Nm3)</th>
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<tr>
<td>TSP</td>
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<tr>
<td>CO</td>
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As noted above, flue gas will be discharged through a steel chimney 35 to 45 meter high and 1.5 meters in diameter. The mathematical air dispersion model “Plume” predicted that there could be impacts on air quality as a result of elevated near-surface concentrations of particulate matter 10 microns in diameter or smaller (PM10). It will be necessary for the project to reduce emissions more than was assumed in the model to make sure that PM10 concentrations near the ground surface are in compliance with the EU and Bulgarian national limits.

**Surface water quality.** During power plant operation, sanitary and process wastewater will be treated on-site before being discharged into the Osam River under a permit issued by the Pleven RIEW. Wastewater quality will need to meet national effluent standards, as well as the EU/EBRD standards for sanitary and industrial sewage discharges. The treatment technology will need to be selected based on its ability to meet these standards. Similarly, technology for reducing water temperatures will need to be selected and implemented to ensure that the temperature of cooling water discharges meets thermal pollution standards.

**Soil and groundwater quality.** There will be no impacts on soil or ground water quality unless there is a spill or leak of fuel or chemicals at the plant site, straw storage area, or the Belene base camp. Fuel and chemical handling and use will take place away from surface water, and wherever possible over an impervious surface. All facilities, and every truck and tractor, will have materials and supplies that can be used to clean up small spills.

**Noise.** Operation of the power plant will generate noise from the steam turbine generators and other rotating equipment, combustion-induced noise, flow-induced noise, and noise from the steam safety valves. All the equipment in the power plant will be designed and operated to keep noise below EU and national Bulgarian work zone (indoor) and ambient (outdoor) noise levels of 70 dB(A), measured at one meter from the equipment and at approximately 1.5 meters above the ground. During harvest season, tractors, trucks, and loading/unloading equipment will cause noise that could disturb nearby residents early and late in the day. Similarly, trucks will be loaded about once per hour throughout the year, and noise (and light) from any night-time operations and traffic could disturb residents near the straw storage areas.

**Visual.** There should be no significant visual impacts from the project. Straw storage areas are in agricultural areas and activities will be similar to what already occurs. Stacks of bales would be visible but should not be objectionable. The plant site will be different than the current view, but is next to a petrol station and near a much larger industrial facility. The Belene base camp is in a developed area. None of the facilities should be visually intrusive.

**Flora, Fauna and NATURA 2000 protected areas.** As noted above, the plant site has been used for industrial activities in the past and is beside a petrol station, so should not have a significant impact on flora or fauna. A barrier between the plant and surrounding areas will reduce disturbance to fauna, including birds. Noise levels from the plant during operation...
should be low and steady, so any resident fauna would quickly become accustomed to the noise. Emissions from the stack should have no effect on flora or fauna.

Besides the Nikopol Plateau bird protection Natura 2000 area and the Persina habitat protection Natura area, there are 47 other designated or proposed Natura 2000 areas within the straw collection area (Figure 3-1). The straw program could potentially affect any of these areas, although there should be no significant impacts on any of them. There would be two primary sources of potential impacts: the harvest itself would affect agricultural lands that are within Natura 2000 areas, and the transport of straw from farms to straw storage areas on roads that cross Natura areas would affect those areas. Impacts from the harvest would result from mowing or cutting crops, especially during bird breeding seasons, damage to nearby habitat that is not used for agriculture, accidental fires, and spills or leaks of fuel or oil from trucks on roads that pass through the areas. Application of operating procedures and mitigation measures will avoid nearly all impacts and reduce or mitigate any that do occur (see Table 2). In addition, it is possible that some land on Natura areas that is not used for agriculture at present would be used to grow straw for sale to the plant. Enemona will work with the Pleven RIEW to determine whether other land should be placed under permanent protection as mitigation. Impacts from trucks or tractors using roads that cross Natura areas should be minimal since there should be only a minor increase in traffic. Drivers will be trained on the location of Natura areas and special precautions that must be taken in those areas to prevent impacts. Overall, impacts on the local flora and fauna, including Natura 2000 protected areas and protected species, are expected to be very minor.

**Potential socioeconomic issues during construction**

*Occupational and public safety and health.* Construction workers could potentially be exposed to contact with diesel fuel and to noise and dust, and would be subject to injuries from slips, trips, and falls. They could also be at risk of collision with equipment and vehicles. Mitigation measures to reduce the risk to employees would include employee training programs that would address construction safety, personal protective equipment, and plans and training for environmental responsibility (for example, spill prevention planning and training). It is very unlikely that people in the closest village, Cherkovitsa, would be affected by noise and dust from plant construction, residents in and near Novachene, Asenovo, and Gulyantsi could experience dust and noise from construction of straw storage areas. Travelers on the roads, and residents of nearby villages, would have an increased risk of traffic accidents. Residents of Belene would also be at increased risk from increased traffic due to construction of the base camp. There should be no impacts away from any of the sites during construction other than truck traffic carrying materials and workers to and from the sites. A traffic plan and proper training for drivers will reduce the risk from traffic incidents. Drivers will limit their speed when passing through or near villages and other populated areas. In addition, at least one person of each work crew will be trained to provide first-aid assistance for minor injuries, and each vehicle will have a first-aid kit. In addition, Enemona will notify local hospitals, emergency responders, and nearby residents of the construction schedule.

*Economics.* There will be potential short employment opportunities for local labor during construction. In addition, fuel and at least some materials used for construction will be purchased from local suppliers. The purchase of these supplies and materials will benefit the local economy. Overall, there would be a minor impact on regional economics. Workers will be paid at least the average regional wage for workers in similar positions.

**Socio-economic issues during operation**

*Traffic.* The most significant impacts could occur from increased traffic associated with straw harvest and storage, and with transporting straw from storage areas to the plant. There will be a significant increase in traffic during the harvest season: heavy trucks and tractors will be entering and leaving the straw areas every 3-5 minutes all day every day for about 45 days, with traffic declining as distance from the storage areas increases. Pedestrians,
Figure 3-1

WGS 1984 UTM Zone 35N

Proposed biomass CHPP

Base camp (vehicle maintenance/storage shop)

Straw storage

Natura 2000 areas within the straw collection area

Nikopol Biomass CHPP

Figure 3-1
particularly in villages near the storage areas, would be at increased risk of injury or death from collisions with trucks and tractors. To reduce and control the risk, there will be a detailed traffic plan. This plan will describe preferred routes, which will avoid schools and populated areas wherever possible. All drivers will be trained and required to follow the plan, which also will include strict rules for speed and vehicle operations, particularly near schools and other areas where children may be present. In addition, all trucks and tractors will be inspected frequently to ensure all their lights and other safety equipment is operating properly. Enemona will notify officials in villages before the harvest season begins in their areas, and will put up warning signs in villages near the storage areas and near the storage areas themselves.

In addition, there will be constant traffic (about one truck round-trip per hour) between straw areas and the plant every day of the year on a non-stop basis. This will create the potential for traffic accidents with other vehicles and with pedestrians along roads between the straw areas and the plant. The same rules will apply as for harvest vehicles: driver training and enforcement of rules, signs in villages and near straw areas, equipment maintenance and repairs, and first aid kits in vehicles.

**Employment.** The project will result in some long-term employment for area residents. The plant will require an as-yet-unknown number of engineers and technicians to monitor performance, some of whom may be local residents and some who may move to the area. The straw collection program will employ up to about 90 temporary workers for about 45 days each year. In addition, there will be permanent employment for truck drivers to deliver straw to the plant year-round, and for workers to load and unload straw at the storage areas. All of this will have a minor beneficial effect on area economics. All workers will be paid at least the average regional wage for workers in similar positions.

**CONCLUSION**

In general, construction of the CHPP Nikopol biomass power plant, straw storage areas and vehicle repair/workshop and maintenance facility will cause only temporary and localized minor environmental and socioeconomic impacts, and will offer minor positive economic impacts. Operation of the plant and straw collection program also should not cause significant impacts if all mitigation measures are properly implemented. Environmental and other permits issued by the Pleven RIEW and other government agencies will require regular reports on whether the facilities are in compliance with the permits. In addition, Enemona will be required to submit reports to EBRD following construction and at least every year during operation, and the reports will describe the environmental performance of the plant and straw program, and describe whether mitigation measures are preventing or controlling major impacts.
# Table 2. Summary of potential impacts and actions to prevent, reduce, or control them

<table>
<thead>
<tr>
<th>Resource</th>
<th>Potential impact/issue of concern</th>
<th>Significance</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>Fugitive dust from vehicles</td>
<td>Negligible to Minor</td>
<td>• Cover excavated topsoil and subsoil stockpiles with plastic covers or seed long-term piles with grass</td>
</tr>
<tr>
<td></td>
<td>Emissions from vehicle operation</td>
<td></td>
<td>• Confine vehicles to defined roadways and travel paths</td>
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<tr>
<td></td>
<td>Pollutant emissions from the power plant (dust, NOx, SOx and CO)</td>
<td></td>
<td>• Restrict unnecessary traffic, limit speed</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Spray water on bare soil to control dust as needed</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Keep vehicles and equipment in good repair, including emission control devices</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Supply workforce with dust masks, require use if needed</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Install and use Best Available Techniques (BAT) as specified in BAT guidelines reference document for the LCP under the EU IPPC Directive: installation of cyclone and bag filter.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Monitor emissions of air pollutants</td>
</tr>
<tr>
<td>Noise</td>
<td>Excessive noise on-site and/or off-site</td>
<td>Very minor and localized</td>
<td>• Notify nearby residents and officials about construction activities before and during construction, and before making loud noises.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Confine construction activities to daylight hours</td>
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<td></td>
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<td></td>
<td>• Provide and require use of hearing protection to construction workers exposed to noise</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Measure noise levels on plant site and in plant. Take measures to reduce noise to standards as needed.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• If requested, measure noise levels at farms, straw areas, and base camp, villages, etc., and take action as needed to reduce levels to meet standards.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Maintain mufflers and other noise controls on vehicles and equipment</td>
</tr>
<tr>
<td></td>
<td>Excess noise in work environments</td>
<td></td>
<td>• Implement noise control measures as needed to meeting standards (equipment selection, silencers for fans, acoustic machine enclosures; noise isolation, mufflers or silencers in intake/exhaust channels; using sound absorptive materials in walls and ceilings; vibration isolators and flexible connections minimize pressure variations in piping, etc).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Make noise measurements and keep records</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>• Provide and require use of hearing protection in noisy areas</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Maintain tractors and trucks to control noise</td>
</tr>
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| Surface water                   | Potential for increased suspended sediments loads into the Osam River stream channel during construction | Minor, mostly during construction | • Minimize disturbance to areas outside construction footprint  
• Segregate excavated soil in stockpiles away from river  
• Compact and/or stabilize disturbed surfaces as soon as practicable.  
• Prevent erosion of sediment into surface waters – construct berm/barrier as one of first construction actions  
• Revegetate with native grass/plants after construction. |
|                                 | Potential for spills/leaks at plant reaching Osam River or old channel via surface runoff, or reaching nearby streams near straw storage area via runoff | Very minor if all prevention and control measures are implemented | • Properly segregate, store, and dispose different wastes (avoid cross-contamination), especially construction, sanitary, and oily wastes, and especially organic and inorganic wastes.  
• Except inert wastes, store on impervious surface. Cover wastes where possible to keep dry.  
• Clean up all spills/leaks immediately  
• Store fuel, oil, and chemicals in designated secure areas.  
• Conduct refueling and chemical use over impervious surfaces  
• Provide spill cleanup kits (drum, absorbent materials) at all areas and in all vehicles  
• Conduct refueling operations at least 100 meters from surface water or stormwater ditches |
| Stormwater management and contamination at plant site, straw storage areas and base camp | Very minor                                                                                       |                                   | • Control stormwater – prevent uncontrolled storm-water run-off that could cause erosion or carry oily wastes or other contaminants by using berms, bales, etc.  
• Provide settling basin for stormwater that may contact bare soil and mobilize eroded materials  
• Consult with authorities on the need for oil-water separators and grease traps before stormwater or process water discharge. Monitor stormwater if needed/required  
• As needed, maintain oil water separators and grease traps at refueling facilities (if any), base camp |
| Contamination by process and sanitary wastewater discharges | Negligible if all prevention and wastewater control measures are                                  |                                   | • Install and implement BAT to treat process and sanitary water  
• Comply with water permit(s)  
• Develop/implement monitoring program for effluent, for |
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|                               | implemented Osam River, and for cut-off meander near plant              |                                                   | Maintain stormwater collection/discharge system and if needed maintain settling basin(s)  
• Keep process and sanitary wastewater completely separate from stormwater  
• Monitor effluent and surface water quality                                      |
|                               | Thermal pollution by cooling water discharges                           | Could be moderate if no control and monitoring are in place | • install BAT (multi-port diffusers, extended-length discharge channel, recirculating cooling water system, closed circuit dry cooling systems such as cooling towers, etc.) as needed to meet thermal discharge standards  
• Monitor discharges and receiving waters for temperature,                        |
| Soil and groundwater          | Accelerated erosion rates at construction sites                       | Minor with appropriate prevention and control measures applied | • Minimize disturbance to areas outside construction footprint  
• Segregate excavated soil in stockpiles  
• Compact and/or stabilize disturbed surfaces as soon as practicable.  
• Revegetate with native grass/plants after construction.                          |
|                               | Soil and groundwater contamination by spills of chemicals, fuel, oil    | Very minor and localized. The risk of spills and leaks will be lower if all prevention and control measures are taken | • Store fuel, oil and chemical in designated secure areas.  
• Conduct refueling over impervious surfaces wherever possible  
• Conduct refueling at least 100 meters from surface water  
• Provide spill cleanup kits (drums, absorbent materials) at all areas and in all vehicles  
• Conduct regular inspections of construction vehicles to identify and repair leaks or damaged fuel/lubricant lines.  
• Maintain supplies to clean up spills and leaks: absorbent materials, drums, etc. (all facilities, all vehicles, all crews)  
• Contain, excavate, and containerize all spills of fuels and hazardous material and dispose of in accordance with local regulations.  
• Place diesel pumps and similar items on drip trays to collect minor spillages. Check trays regularly and remove any accumulated oil. |
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<td>Ash management</td>
<td>Positive impact of selling straw ash as fertilizer</td>
<td>Minor to Moderate beneficial</td>
<td>• Continue to work with Ministry of Agriculture on use of ash as soil amendment.</td>
</tr>
<tr>
<td>Waste and hazardous materials management</td>
<td>Soil and groundwater contamination from fuel, waste, or chemical mismanagement</td>
<td>Minor if proper waste management practices are employed</td>
<td>• Develop and implement waste management plan for operations phase&lt;br&gt;• Obtain and comply with all waste permits/regulations&lt;br&gt;• Develop waste register for the power plant and vehicle repair/maintenance facility&lt;br&gt;• Identify waste reduction and recycling opportunities&lt;br&gt;• Segregate, store, transport, and dispose domestic, industrial and hazardous waste at nearest authorized landfills/facilities.&lt;br&gt;• Continue to work with Ministry of Agriculture on use of ash as soil amendment&lt;br&gt;• Inventory all chemicals, hazardous materials, fuel, including&lt;br&gt;• Consult with local fire officials on emergency response procedures&lt;br&gt;• Use BAT for fuel storage tank at base camp&lt;br&gt;• Conduct refueling at least 100 meters from surface water&lt;br&gt;• Train all personnel who deal with hazardous materials&lt;br&gt;• Provide spill cleanup materials (drum, absorbent materials) in all work areas and all tractors and trucks, and train workers on use&lt;br&gt;• Clean up all spills/leaks immediately</td>
</tr>
<tr>
<td>Flora, Fauna, and NATURA 2000 protected areas</td>
<td>Damage to habitat or living organisms</td>
<td>Minor</td>
<td>• Consult with Pleven RIEW and NGOs who monitor Natura areas to develop avoidance and mitigation&lt;br&gt;• For farms in Natura areas, train drivers and workers to stay on agricultural fields&lt;br&gt;• Minimize traffic through Natura areas, avoid stopping&lt;br&gt;• If new straw contracts will result in re-cultivation of abandoned lands in Natura areas, consult with RIEW concerning possible mitigation or further study (for example, a compatibility report)</td>
</tr>
<tr>
<td>Land use and Natura 2000</td>
<td>As a long-term potential impact - conversion of Natura 2000 non-agricultural areas into agricultural lands.</td>
<td>Moderate to Major if no prevention and control measures are employed</td>
<td>Do not sign contracts to purchase straw grown on non-agricultural lands in Natura areas without mitigation approved by Pleven RIEW (for example, permanent protection of equivalent land)</td>
</tr>
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| **Traffic congestion**            | • Risks to public from heavy traffic to occur on rural roads and through villages during construction and especially operation  
  • Traffic congestion at entrance to plant site and/or straw storage areas  
  • Potential collisions with other vehicles or pedestrians (death, injury, property damage) | Minor to Moderate. Could be minor if all required traffic management and control measures are implemented. | • Develop and implement traffic management plan  
  • Consult with local authorities to improve signage, visibility and overall safety of roads near plant, straw areas, and base camp.  
  • Consider hiring transportation manager/expert  
  • Place signs in Chernovitsa, in villages near straw areas, in Belene near base camp, and on road near plant to inform motorists of construction schedules  
  • Employ traffic control measures (temporary signs, markers, flagmen, etc.) during times of heavy traffic or road blockage  
  • Consult with emergency responders to ensure support for injuries or fire  
  • Keep all vehicles and equipment in good working order  
  • Train all drivers  
  • Observe all traffic and safety regulations, including rules for wide loads and weight. |
| **Community and occupational health and safety** | Risk to public health and safety. Injury or death to non-workers during construction and operation | Minor to Negligible if appropriately mitigated | • Develop and implement public health and safety plan.  
  • Implement traffic plan and emergency response plan |
|                                   | Risk to workers health and safety. Worker injury or death during construction and operation | Minor to Negligible if appropriately mitigated | • Develop and implement occupational health and safety plan (noise, toxics, traffic, equipment operation, personal protective equipment etc.) |
|                                   | Risks to pedestrians and motorists from traffic | | • See traffic congestion above |
| **Socioeconomic issues**          | Public lacks of up-to-date information on project construction status and progress | Moderate. Limited to construction period. | • Announcements (signboards, radio/TV) of major construction events/developments/plans  
  • Consultations with local officials near plant, base camp, and straw areas before and during construction |
|                                   | Poor communication with key project stakeholders | Moderate to Major. Limited to operation stage. | • Consultation with officials in villages before harvest begins near them  
  • Periodic publicity about project’s record – safety record, environmental compliance record, economic contribution, employment, etc.  
  • Initial and continuing communications with those responsible for Natura 2000 within straw collection area |
|                                   | Employment: - fair labor practices | Moderate to Major. Mostly relevant to the | • To extent feasible, hire and train local workers for temporary and permanent positions |
### Non-Technical Summary:

**Environmental and Social Impact Assessment of the Proposed Nikopol Biomass CHPP, Bulgaria**

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|          | - unrealistic expectations         | construction period and initial operations | • Provide realistic information on employment opportunities, with transparent hiring practices  
• Advertise for all positions  
• Pay at least regional average wages for comparable positions |