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SUPPLEMENTARY INFORMATION

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR NIKOPOL BIOMASS CHPP

October 2009

Prepared for:

and

Enemona SA
Ivan Vazov District,
1 Balsha Street, bldg. 9, floor
1408 Sofia
Bulgaria

150 Vitosha Street, bldg. 70, vh A,
floor 2, apt.3
Ivan Vazov District
1408 Sofia
Bulgaria

Prepared by:

BLACK & VEATCH
Black & Veatch Special Projects Corp.
1120 Sanctuary Parkway, Suite 200
Alpharetta, Georgia 30022 USA

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Prepared by:	Black & Veatch Special Projects Corp.
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Prepared by:	Sarah Howard (straw), Mike Johnsen (GIS), Ajay Kasarabada (carbon emissions), Mary Matthews (PCDP), Ivan Maximov (management and monitoring plans), Jack Mozingo
B&V Project Manager:	Jack Mozingo
CHPP Project Manager:	Boris Petlov

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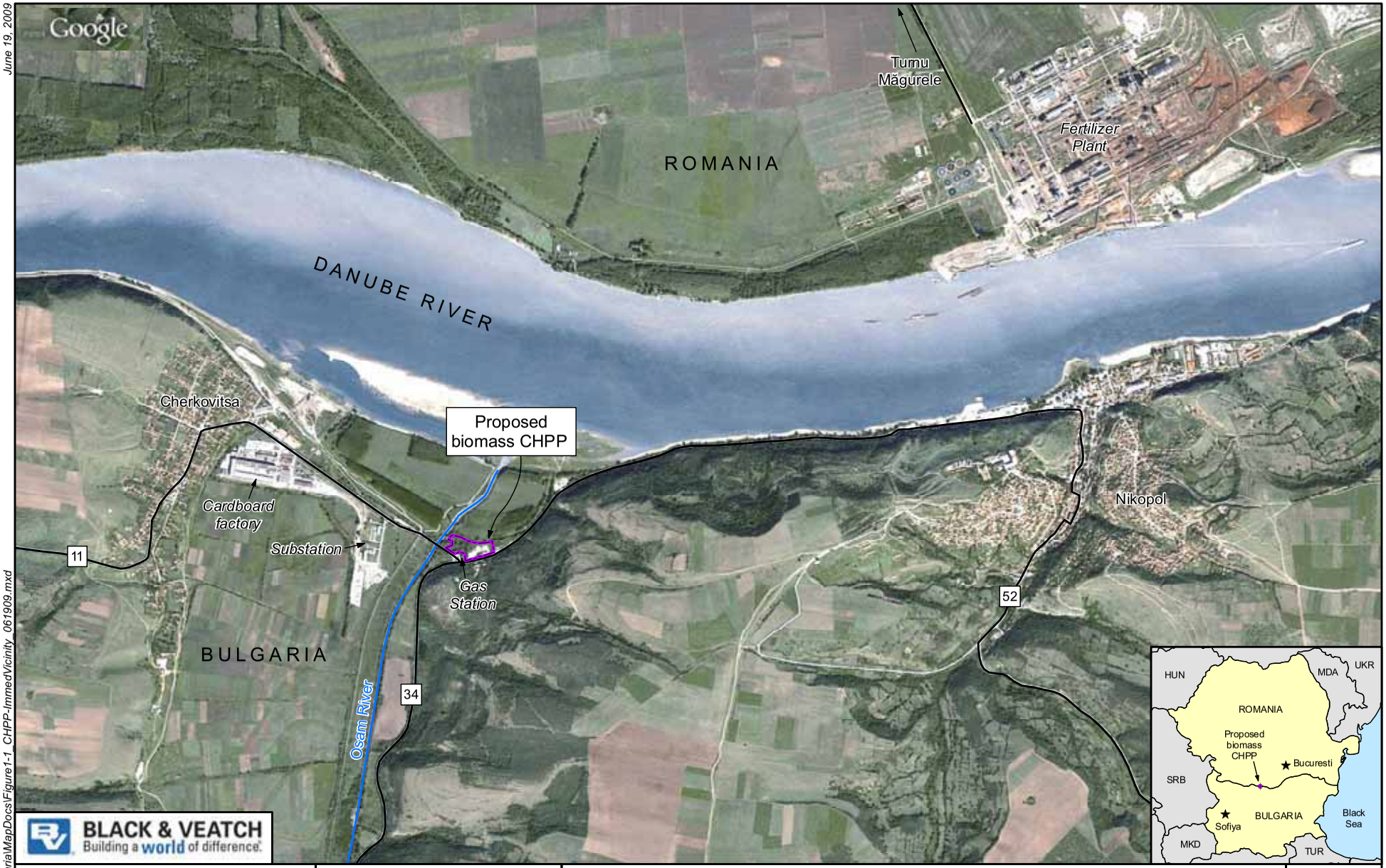
1.0 INTRODUCTION

Enemona SA, a Bulgarian company, proposes to construct a combined heat and power plant (CHPP) fired by agricultural biomass (straw) in the Nikopol municipality in North Bulgaria. The plant would be operated by CHPP Nikopol JSC, a subsidiary of Enemona SA. The plant will be located adjacent to the Osam River near the village of Cherkovitsa in Pleven District. The plant will burn straw that has been collected from Bulgarian agricultural lands within about 100 kilometers of the site and stored in one of three storage areas. A separate subsidiary of Enemona SA will operate the straw collection and transport program. Figure 1-1 shows the location of the plant site and support facilities.

Enemona SA has approached the European Bank for Reconstruction and Development (EBRD) for project financing. EBRD has determined the project should be classified as category A under the Bank's 2003 *Environmental Policy* and thus requires an environmental and social assessment (EIA) that meets EBRD and European Union standards. Bulgarian law and regulations (or "ordinances") also require an EIA. The EIA was submitted to the Pleven Regional Inspectorate of Environment and Water (RIEW, or the Regional Inspectorate) in March 2009, then again in April 2009, and further information was submitted in August 2009. Once the Ministry approves the EIA for public release, Enemona SA will schedule one or more public meetings at which the findings of the EIA will be disclosed to the public and at which members of the public and other stakeholders may present their comments and opinions.

Certain aspects of the project were not covered in the Bulgarian EIA. This report includes the supplementary information needed to fill perceived gaps. The report includes the following components:

- A conceptual evaluation of the straw collection and transportation program is presented in section 2 of this document. The Regional Inspectorate determined that this component of the project was outside the scope of the national EIA, so this supplemental evaluation was prepared.
- An overview of impacts on Natura 2000 areas is presented in section 3. The EIA included a Compatibility Report to meet Bulgarian law. This report evaluated the extent to which CHPP construction and operation was compatible with the two Natura areas in the immediate vicinity of the plant. However, there are many more designated (or proposed) Natura areas within the area where straw will be collected that are not identified or otherwise evaluated in the EIA. The supplementary information in section 3 identifies the Natura areas in the straw collection area and summarizes potential impacts.
- An overview of carbon emissions from the plant and associated operations is presented in section 4, along with emissions that could be expected from a coal-fired power plant that generated about the same amount of electricity.
- A Public Consultation and Disclosure Plan is presented in section 5. Bulgarian law requires public consultation during the EIA process and disclosure of the draft EIA. However, EBRD and international financial institutions require a formal plan for consultation and disclosure of the EIA and supplementary information. The PCDP was prepared to supplement Enemona's initial consultation and disclosure program.
- An Environmental and Social Management Plan and an Environmental and Social Monitoring Plan are in section 6. The management plan describes actions that will be taken to avoid, reduce, or mitigate potential impacts and the monitoring plan identifies the monitoring program that needs to be implemented to verify that mitigation measures are working and to allow the management plan to be refined as needed to minimize impacts.



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N

0 0.5 1
Kilometers

WGS 1984 UTM Zone 35N

Proposed biomass CHPP
Roads (2nd grade)

Proposed biomass CHPP and immediate vicinity

Nikopol, Bulgaria

Figure 1-1

June 19, 2009

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2.0 EVALUATION OF STRAW COLLECTION AND TRANSPORTATION PROGRAM

As described in the Environmental Impact Assessment (EIA), the Nikopol Biomass Combined Heath and Power Plant (CHPP) will burn about 110,000 tonnes of biomass fuel each year to produce electricity. The biomass will be mostly "straw", crop waste or crops that have sufficient fuel value to be economical. Collecting, storing, and transporting this much straw to the plant is a formidable undertaking that will require a detailed plan to cover each stage of the process. In summary, straw will be harvested and bound into bales on nearby farms, transported to one of three storage areas, stored until it is needed for fuel, transported from storage areas to the plant, stored on the plant site for up to four days, and then burned.

The Ministry of Environment and Water advised Enemona that the straw program did not need to be covered in the Bulgarian EIA. Because implementation of the program could result in potential environmental and socioeconomic impacts, international standards require that the potential impacts be evaluated and, if necessary, reduced or otherwise mitigated. This section describes the straw program and provides an assessment of its potential impacts. The full straw program is still being designed, so this assessment makes certain assumptions about various details. Thus, the evaluation of impacts is necessarily somewhat "conceptual." Should final details of the program be significantly different than assumed herein, the impacts may need to be re-examined and the mitigation and monitoring plans refined. The remainder of this chapter includes the following.

- A description of the straw collection, storage, and transport program is presented in section 2.1.
- The potential impacts of the straw program are described in sections 2.2 (harvest), 2.3 (transport from farms to storage areas), 2.4 (transport from storage areas to plant), and 2.5 (Belene base camp).
- The potential impacts and mitigation measures are summarized in section 2.6.
- The environmental and social management and monitoring plans are presented in section 2.7.

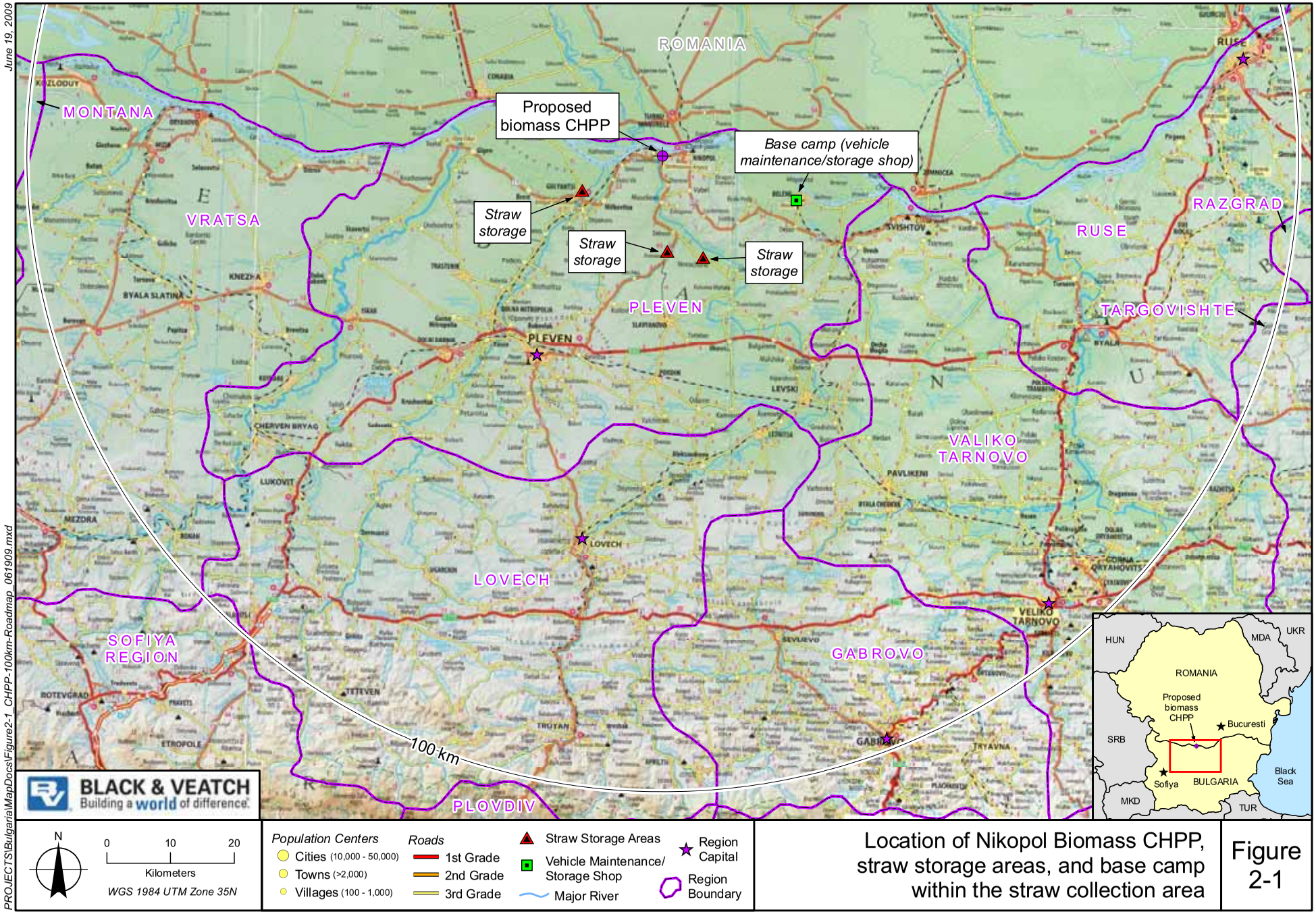
2.1 Overview of Straw Program

The straw program will include four distinct stages: collection, transport to storage, storage, and transport to the Nikopol CHPP. In addition, there will be a "base camp" in Belene at which vehicles and equipment will be stored and serviced. These elements of the straw program are described in the subsections below. Although the remainder of this section may refer to Enemona as operating the straw program, it should be noted that the straw program will actually be owned and operated by a separate company set up by Enemona.

2.1.1 Straw collection

Straw will be collected from farms in Bulgaria within about 100 kilometers of the plant, a total of about 16,517 square kilometers. Figure 2-1 shows the area from which straw will be collected. Each year, Enemona SA will purchase about 125,000 tonnes from individual farmers and farm cooperatives[1]. Using very conservative assumptions, Enemona estimates there are over 215,000 tonnes of straw available within that area, of which Enemona will use about 58 percent (CHPP Nikopol, undated).

[1] The plant will burn about 110,000 tonnes of fuel per year. Before and during storage, there is expected to be a loss of about 10-12 percent of the straw due to wastage, degradation, and other factors. Thus, a total of about 125,000 tonnes will need to be purchased and stored each year.



Location of Nikopol Biomass CHPP, straw storage areas, and base camp within the straw collection area

Figure 2-1

It is assumed that straw will come from farms evenly distributed throughout the collection zone, although it is likely that somewhat more straw will come from farms closer to the storage areas rather than from farms farther away. Table 2-1 shows that the straw collection area covers all of one region (Pleven), most of five other regions (Gabrovo, Lovech, Ruse, Veliko Tarnovo, and Vratsa), and very small portions of four other regions (Montana, Razgrad, Sofiya Region, and Targovishte). Although populations within the collection zone are shown Table 2-1, the number that could be affected by the program would be much smaller since there are several cities in the collection area where there will be no impact at all.

Table 2-1. Regions represented within the straw collection area

A	*B*	*C*	*D*	*E*	*F*
Region/Oblast	*Total area (square kilometers)*	*Area within circle (square kilometers)*	*Percentage of region within circle*	*Total population*	*Estimated population within circle*
Gabrovo	2,105	1,558	74%	144,150	106,692
Lovech	4,015	3,534	88%	169,951	149,591
Montana	3,828	25	1%	182,267	1,190
Pleven	4,295	4,295	100%	312,018	312,018
Razgrad	2,618	24	1%	152,417	1,397
Ruse	2,825	1,879	67%	266,213	177,067
Sofiya Region	6,971	14	0%	273,252	549
Targovishte	2,641	58	2%	137,689	3,024
Veliko Tarnovo	4,119	2,639	64%	293,294	187,910
Vratsa	3,914	2,491	64%	243,039	154,678
Totals	37,331	16,517		2,174,290	962,009

Column B source: http://www.mapmart.com/Products/DigitalVectorMapping/VMAP.aspx (URL active 10 June 2009)
Column C: area within the semi-circle centered on CHPP and with radius of 100 kilometers shown on Figure 2-1
Column D: Column C as a percentage of Column B (percentage of total area within straw collection circle)
Column E source: http://www.statoids.com/ubg.html, http://en.journey.bg/bulgaria/map.php (URLs active 10 June 2009)
Column F: Population within straw collection circle, based on percentage of area within straw collection circle (Column D) applied to total population of region (Column E)

Straw will be collected during a harvest period of about 45 days in late summer and fall. Straw collection will require the use of 30 to 60 heavy-duty farm tractors, 30 to 60 medium-duty tractors, and 30 to 60 straw baling machines (see Figure 2-2). These would be purchased or leased by Enemona unless individual farms or collective farms own or lease their own equipment. In some cases, Enemona may lease its equipment to farms and farm collectives.

Straw collection will include cutting and baling activities that would occur for 8 to 12 hours a day, 7 days a week, during dry weather. Straw will not be collected in wet wather, so equipment would remain on the farm until the rain clears and the fields are dry enough for harvest to resume. The heavy-duty and medium-duty farm tractors with pull-behind balers

Figure 2-2. Typical views of a tractor and a baling machine

would work through the fields cutting the straw and producing the bales. The bales will each be 2.4 meters by 1.2 meters by 1 meter wide (some bales may be slightly smaller, at 1.2 x 0.70 x 2.4 meters) and weigh 300-400 kilograms. Bales will be bound with a plastic twine that can be burned with the straw.

Although plans are not yet final, straw bales on most farms will probably be moved from the fields to a central location on the farm, or to a location on the farm that can be reached by a truck. Bales would be left on the ground until picked up for transport to a storage area. Fuel for tractors and other equipment would be brought to the farms by an Enemona tanker truck, or taken from fuel stored on the farm.

2.1.2 Transport from farm fields to storage areas

The straw bales would be transported from farms to one of three separate locations. Most roads in the area are paved with asphalt or concrete, and most roads experience relatively light traffic. Figure 2-1 shows the road network and the three storage areas. The storage areas include:

- One area north of Bulgaria Highway 11 near Gulyantsi village. This area is about 20 kilometers by road from the CHPP.
- One area on Highway 34 near Asenovo village, about 18.5 kilometers from the plant. This area is about 18.5 kilometers from the CHPP and 57 kilometers from the Gulyantsi storage area.
- One area on a third-grade road near Novachene village. This area is about 21.5 kilometers from the plant, 40.4 kilometers from the Gulyantsi storage area, and 8.6 kilometers from the Asenovo storage area.

The exact size and capacity of the storage areas are not yet known. Each area will be a different size, and each will cover an area of at least 40,000 to 50,000 square meters. By the end of each harvest season, the three areas will store a total of 125,000 tonnes (415,800 bales, assuming 300 kilograms per bale), enough to supply 110,000 tonnes to the plant over the following 12 months. Bales will be stacked in piles that are five or more bales high (that is, five or more meters high). Each stack of bales will be covered with plastic to keep rain off the straw.

Throughout the 45-day harvest season, and possibly for some time afterward, bales of straw will be moved from farms to the storage areas. Lifting equipment (for example, a front-end loader, fork lift, etc.) or attachments to a tractor will be used to lift bales onto the truck or trailer, and then to remove them from the truck or trailer and place them in stacks at the storage area. For farms within about 10 kilometers of a straw storage area, bales may be carried in carts pulled by tractors. Each cart can hold 12 to 14 bales. For farms farther than 10 kilometers, bales will be loaded onto “board trucks” and cart trailers pulled by these

trucks, or onto semi-trailers pulled by road trucks. Board trucks can carry about 48 bales and road trucks about 44 bales.

Moving nearly 417,000 bales (125,000 tonnes at 300 kilograms per bale) of straw from farms to the storage areas within 45 days will require moving about 9,260 bales per day (2,778 tonnes per day). At an average of about 35 bales per trip (12-14 for carts pulled by tractors, 44 for road trucks, and 48 for board trucks), this will require about 264 vehicle-trips per day for 45 days, or about 88 vehicle-trips per day to each storage area.

Following the harvest season, tractors and baling equipment will be stored for the winter and spring. It is not known at this time whether they will be stored at the base camp, at one or more farms, or elsewhere. A fuel truck of uncertain capacity (typical capacity is about 5,500 liters) will travel between the storage areas to provide diesel fuel for the tractors and trucks. It will be refilled as needed at the base camp or at the nearest public fueling station.

The villages that lie nearest the straw storage areas would have the greatest potential for impacts, largely due to transportation of straw from farms to the storage areas and from these areas to the plant. Villages that lie within 25 kilometers of at least one of the areas are shown in Table 2-2.

Table 2-2. Villages and towns within 25 kilometers of a straw storage area

Village/town	*Gulyantsi storage area*	*Asenova storage area*	*Novachene storage area*	*Road distance to nearest straw area*
Asenovo	31	1	9	*1*
Batsova Mahala	41	16	8	*8*
Bivolare	22	36	44	*22*
Bozhuritsa	20	41	49	*20*
Brashlyanitsa	12	20	28	*12*
Brest	9	40	48	*9*
Bulgarene	50	29	20	*20*
Byala Voda	46	19	21	*19*
Cherkovitsa	18	20	22	*18*
Dabovan	12	44	52	*12*
Debovo	35	4	6	*4*
Dolni Vit	9	29	32	*9*
Dragash Voyvoda	32	22	27	*22*
Evlogievo	31	13	15	*13*
Gigen	20	51	59	*20*
Grivitsa	30	24	42	*24*
Gulyantsi	0	32	41	*0*
Isgrev	49	24	15	*15*
Iskar	24	55	63	*24*
Koilovtsi	21	15	23	*15*
Komarevo	10	40	49	*10*
Kreta	6	32	43	*6*
Lenkovo	8	24	33	*8*
Lozitsa	42	15	18	*15*
Lyubenovo	35	9	11	*9*

Table 2-2. Villages and towns within 25 kilometers of a straw storage area				
Village/town	*Gulyantsi storage area*	*Asenova storage area*	*Novachene storage area*	*Road distance to nearest straw area*
Mechka	25	7	16	*7*
Milkovitsa	5	32	35	*5*
Muselievo	28	10	13	*10*
Nikopol	24	20	24	*20*
Novachene	41	8	1	*1*
Obnova	42	25	17	*17*
Pobeda	21	40	48	*21*
Podem	15	43	51	*15*
Riben	19	46	54	*19*
Sanadinovo	47	15	6	*6*
Shiyakovo	5	28	36	*5*
Slavyanovo	30	24	19	*19*
Somovit	12	26	29	*12*
Totleben	35	28	23	*23*
Tranchovitsa	43	18	10	*10*
Vabel	31	13	19	*13*
Varbitsa	24	19	27	*19*
Zagrazhden	17	49	57	*17*
Zhernov	25	13	16	*13*

2.1.3 Transport from storage areas to Nikopol CHPP

A straw storage area at the CHPP will hold enough straw to fuel the plant for at least about four days. Bales of straw will be transported from the three storage areas to the plant storage area by board trucks and road trucks for 24 hours per day, seven days per week. The plant will burn about 300 tonnes (about 1,000 bales) of straw per day. At an average of 46 bales per truck, this will require about 21 or 22 round-trips between storage and the plant every day, or about one truck every 66 minutes. At 40 kilometers per round-trip, this will require about 880 road kilometers per day.

The number of trucks to be used and the number of drivers to be employed are not known at present. Similarly, it is not known how many additional equipment operators and workers will be needed to load straw onto trucks and then to unload straw at the plant.

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2.1.4 Vehicle maintenance base camp

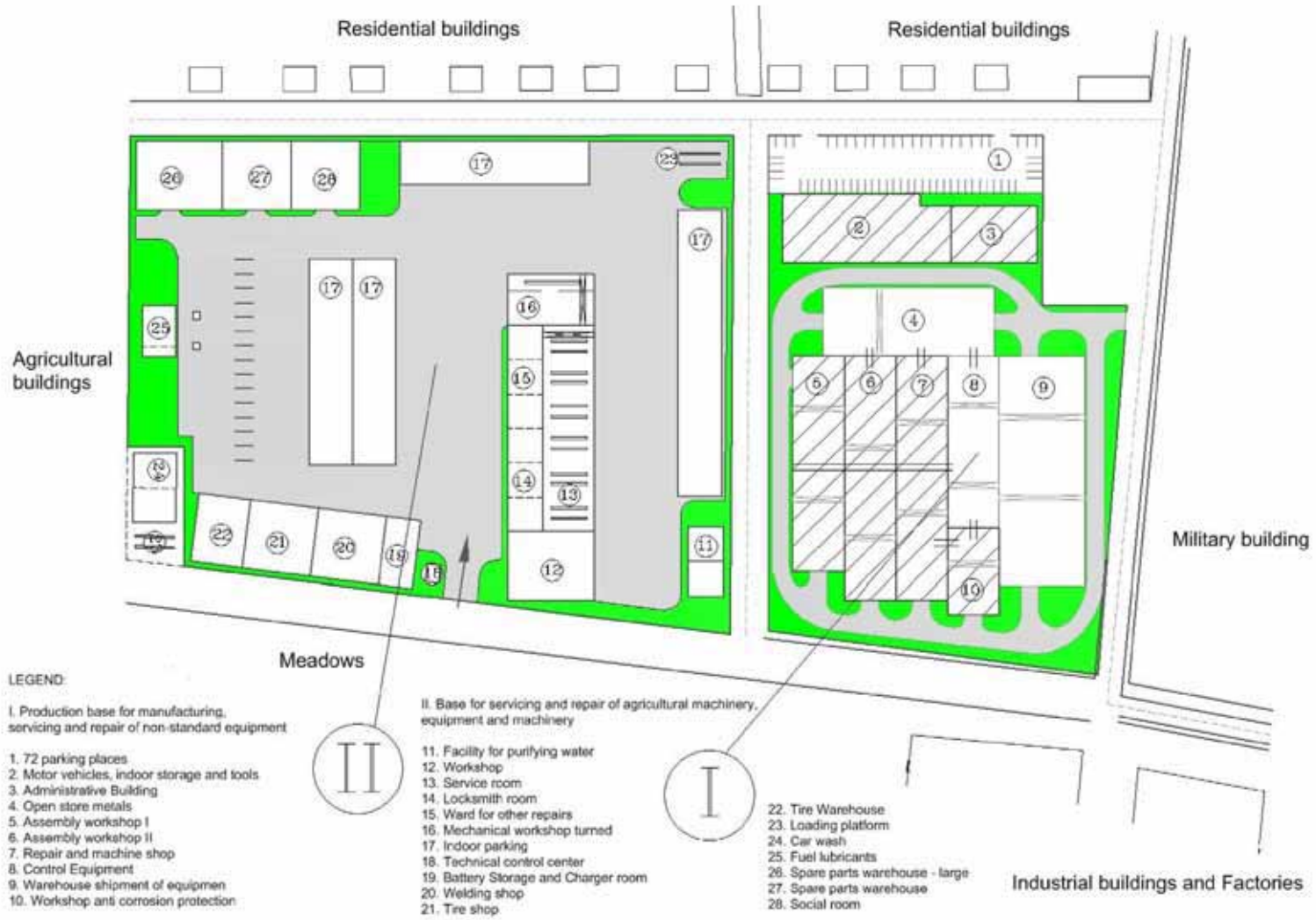
A vehicle repair and maintenance base camp will be located in the town of Belene (Figure 2-3). The layout of the facility is shown in Figure 2-4. The base camp would employ mechanics and other service personnel to maintain and repair all trucks, tractors, balers, and other equipment. During harvest, service personnel would conduct routine maintenance and make repairs in the field if possible, but if that is not possible vehicles and equipment would be transported to the base camp for maintenance and repairs.

It is possible that diesel fuel for the fleet of tractors and trucks, and the refueling tanker, will be stored at the base camp, but this has not been determined. If fuel is stored here, the tanks will be installed, maintained, and monitored in compliance with Bulgarian law and will be placed over an impervious surface. If fuel is not stored here, it will come from regional

June 19, 2009

CHPP NIKOPOL Belene

Combined Heat and Power Plant Nikopol JSC



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Vehicle repair and maintenance base camp – Belene
Nikopol Biomass CHPP

Figure 2-3

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Figure 2-4. Location of the proposed vehicle repair and maintenance base camp in Belene

wholesale or retail dealers. The number of employees at this facility is also not yet known. During winter, it is likely but uncertain whether tractors and trucks will be parked at the base camp.

2.2 Potential impacts of the straw program and Belene base camp

2.2.1 Potential impacts from construction of straw storage areas, and base camp

Construction of straw storage areas should take only a short time, perhaps as long as 30 days. Enemona selected areas so they will not require significant grading or earthmoving, and as a result they will require a minimum amount of vegetation clearing. Ramps from main roads onto the storage areas will be covered with gravel or other material, and on-site routes for heavy equipment may need to be graveled or otherwise protected. Access will be gained by driving off the highway onto the gravel or otherwise improved access ramp. Construction of the base camp would take somewhat longer, but not more than a few weeks.

There would be some temporary employment for construction of straw storage areas and the base camp, although the number of workers is not known at present.

Potential environmental impacts associated with construction of the straw storage areas would be related to air quality, noise, transportation, surface water, groundwater, vegetation, and personnel safety. In addition, there would be economic effects. Potential impacts from construction of the base camp would include dust, noise, transportation, and personal safety.

2.2.1.1 Air Quality

The construction phase for straw storage areas would include land clearing, topsoil removal, material loading and hauling, stockpiling, grading, bulldozing, compaction, etc. Each of these

operations would take only a few days but would have the potential for generating airborne dust particles. Dust emissions would vary from day to day depending upon the specific activity and meteorological conditions. In general, any impacts would be very localized. Dust control measures may be appropriate in the construction laydown area, parking areas, site roads, or construction areas during dry weather periods, and this could be achieved using a water truck sprayer or other water application. During initial construction activities, dust control activities could be more frequent due to land clearing activities, site-leveling, general earthwork, stockpiling, and the application of aggregate/gravel. Areas would be reseeded when construction is complete to ensure on-going dust creation does not occur.

In addition, equipment and vehicle engines would generate pollutants from fuel combustion. There would be some increase in pollutant emissions from equipment and vehicle engine exhaust. All vehicles and machinery would comply with applicable standards regarding emissions. Additionally, the vehicles would be maintained in good running condition to reduce unnecessary emissions.

With these construction practices, vehicle emissions and dust generation should be minimal.

2.2.1.2 Noise

Increases in ambient noise levels from construction of the straw storage areas and the base camp would be short-term, intermittent, and limited to day-time working hours. There is limited potential for off-site noise impacts at the straw storage areas since receptors would be at least several hundred meters away. The base camp, on the other hand, is in the midst of an urban area with receptors less than a few tens of meters from the site.

Construction of the straw storage areas would cause noise from operating vehicles and equipment. Base camp construction would have the same sources, plus demolition, hammering, and other short-term noise. Construction equipment is powered with diesel engines that generally operate at approximately 100 decibels (dB) or less. Generally, noise rapidly attenuates with distance from the noise source. At only 100 meters away from a 100 dB noise source, a listener experiences a 49 dB sound level (normal conversation is typically about 70 dB). All equipment will be maintained in good working condition, and this will minimize excessive equipment noise. Therefore, construction site noise should only occasionally represent a very short-term, intermittent nuisance, and then only in the immediate vicinity (see occupational health and safety in section 2.2.1.7). No mitigation will be needed for off-site noise levels at the base camps other than to keep equipment and vehicles in good working order. For the base camp, care will be taken not to cause unnecessary noise, and to notify neighboring houses or businesses before any short-term loud noises. Overall, there would be negligible impacts from off-site noise due to construction of straw storage areas and only minor impacts from construction of the base camp.

2.2.1.3 Transportation

Construction of the straw storage areas and base camp would cause short-term traffic impacts caused by delivery of workers, materials, and equipment, including heavy construction equipment. Large equipment would be transported on potentially slow-moving semi-tractor trailer combinations. The majority of traffic impacts near straw storage areas would occur at the beginning and the end of construction period, when the major equipment and materials are being moved on and off the sites. Construction vehicles coming onsite would be traveling through towns and villages along the route, which could affect traffic and pedestrians. However, even at peak periods, there should be no more than a very few vehicles per day. Additionally, onsite construction traffic could pose a potential risk to workers.

Base camp construction could cause localized congestion near the facility when materials and equipment are being brought to the site. In addition, some workers would be transported to the site each day.

Prior to construction, Enemona will meet with the nearest traffic officials and emergency responders to inform them about the construction schedule and what can be anticipated during construction. They will also collaborate with nearby local communities and responsible authorities to improve traffic signage, visibility, and overall safety of roads, particularly along stretches located near schools and other locations where children may be present. Signs will also be placed on roads near the straw areas and the base camp warning drivers of ongoing construction and traffic.

Potential pedestrian interaction with construction vehicles should be minimized to reduce the potential impact to onsite personnel. A well-planned construction sequence and well-marked pedestrian and vehicle routes on the storage areas and the base camp will reduce the potential for incidents. Additionally, safe construction practices will be implemented for each task to reduce the potential for injury to the onsite workforce. Mitigating potential pedestrian interaction with construction vehicles and equipment will include the establishment of onsite pedestrian walkways for crossing intersections, and speed limit signage.

Overall, potential impacts on local traffic should be minor because it will be of very limited duration and will involve only a few vehicles per day at its peak.

2.2.1.4 Surface water

Potential temporary impacts to surface water from construction of the straw storage areas and the base camp would be stormwater runoff as well as fuel, oil, or chemical spills associated with refueling or with vehicle or equipment leaks.

A primary concern with stormwater runoff from any construction site is the loss of soil and the impact of soil on water quality. For each storage area, there will be an engineering plan that minimizes soil loss through good housekeeping practices, erosion and sediment control best management practices (for example, silt fences along all waterways, straw bales, check-dams, seeding), inspections and maintenance, and training. The construction foreman will be responsible for making sure the plan is implemented and for monitoring to ensure erosion is controlled.

There will also be a plan to prevent and control spills during construction. This plan will require an inventory of fuel, oil, and chemicals on the site, and will identify secondary containment or control measures, personnel safety, spill response measures, emergency phone numbers and contact names. Employees will be trained in the handling of fuel, oil, and chemicals on site, and in responding to spills. Implementation of the plan will require routine inspection and maintenance activities to ensure good housekeeping practices are being used. Again, the foreman will be responsible for implementation of the plan.

The development and careful implementation of these plans will ensure that potential impacts of construction on surface water are negligible or minor.

2.2.1.5 Groundwater

Construction should not affect groundwater.

2.2.1.6 Vegetation

The Asenovo straw storage area is currently used for growing crops. Most of the Gulyantsi area is covered in grass, with some shrubs and trees. A building and some paved areas are on the site of the Novachene storage area, which also has some grass and shrubs. All the

storage areas have experienced significant disturbance due to human activities for many years.

2.2.1.7 Occupational safety and health

Construction workers could potentially be exposed to contact with diesel fuel and to noise and dust from equipment operations; and would be subject to slips, trips, and fall hazards. 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 environmental responsibility (for example, spill plan training). At least one person in each crew will be trained in first aid, and the foreman will brief all workers in required safety precautions. In all cases, appropriate personal protective equipment will be made available to workers, including hard hats and safety goggles, hearing protection, dust masks, gloves, protective shoes, etc. Potential impacts could be major and adverse should accidents happen. With proper mitigation, however, impacts should not be significant.

2.2.1.8 Economic impacts

Temporary workers will be hired for construction, both local unskilled laborers and skilled workers and equipment operators from nearby towns. The number is not known but could reach 10-20 workers at times. It is probable but not yet certain that Enemona will provide transportation for workers. Salaries and wages are not known, but will be at least at regional or nationwide averages (whichever is highest) for workers in each employment category (equipment operator, engineer, laborer, etc.). The overall impact on the local and regional economy will be positive, but minor.

2.2.2 Potential impacts from straw harvest

As noted above, the harvest is anticipated to be complete within about 45 days. Harvest would involve the use of 30-60 heavy-duty farm tractors, 30-60 medium-duty tractors, baling equipment pulled by the tractors (Figure 2-2), and small carts pulled by the tractors. As noted above, straw would be cut and, after a day or more of drying, the tractor would pull a baling machine through the fields in order to pick up, pack, and tie the bales (Figure 2-5). Bales would then be collected from the field and stored in a temporary area on the farm before being transported to a storage area (section 2.2.3). Tractors would be refueled by an Enemona tanker truck or from farm fuel tanks.

Straw harvest would employ approximately 90 people and would take place for 8 to 12 hours per day for seven days per week throughout the approximately 45-day harvest period. Heavy equipment (for example, forklifts or loaders) would lift bales and place them into carts to be pulled by tractors, cart trailers or board trucks, or semi-trailers (Figure 2-5).

Figure 2-5. Bales being lifted onto cart pulled by a tractor

Potential impacts associated with this type of aggressive operation include air quality (dust and diesel emissions), fuel or oil leaks/spills, health and safety, and economic.

2.2.2.1 Air Quality

Tractors traveling along dry unpaved tracks on farms will cause fugitive dust. Only if dust becomes severe and impedes operations should any mitigation be required, and this would take the form of applying water to dusty areas and providing masks to workers. If watering becomes necessary, equipment from the farm would be used to spray enough water to reduce dust. In general, baling and handling dry straw should not cause excess levels of dust. The straw will likely have its maximum moisture content at harvest (possibly 20 percent moisture or more), and this should help reduce dusting. Should there be local dust problems occasionally, small amounts of water may be applied.

All the tractors will have diesel engines. There will be as many as 60 to 120 farm tractors operating throughout the harvest period. About half the tractors will be equipped with baling machines; the other half will have trailers and front or rear loaders. Tractors will not be concentrated in any one place but will be spread among many farms at any one time.

Air emissions from tractors were calculated based upon operating the equipment 24 hours per day for 45 days. Emissions were calculated for heavy-duty and medium-duty categories. Emissions were estimated using guidance published by the European Environment Agency (2007). Table 2-3 shows total emissions of each major air pollutant.

Table 2-3. Air emissions by tractors during straw harvest

Type tractor	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of tractors*	*Total emissions (kg)*
Heavy-duty	NOx	25.0	45	60	67,500
Medium-duty		3.82		60	10,314
Total NOx					77,814
Heavy-duty	CO	3.67	45	60	9,909
Medium-duty		1.22		60	3,294
Total CO					13,203
Heavy-duty	NM-VOC	1.67	45	60	4,509
Medium-duty		0.56		60	1,512
Total NM-VOC					6,021
Heavy-duty	PM10	0.89	45	60	2,403
Medium-duty		0.29		60	783
Total PM10					3,186

The area in which emissions will occur is so large that overall impacts from this level of emissions would be very minor. Enemona will need to have the tractor engines serviced regularly and kept in good working condition in order to keep air emissions low.

2.2.2.2 Soil and water quality

Initially, farm tractors and balers will be new and in excellent working condition, but over time there will be malfunctions and breakdowns that could release diesel fuel, motor oil, and/or hydraulic fluids into the environment. In addition, there could be leaks and spills when tractors are refueled by a tanker truck or from farm tanks. Spilled material would contaminate soil, surface water, and shallow groundwater. To prevent potential water contamination, tractors will not be refueled within 50 meters of surface water or wetlands.

Both tanker truck drivers and tractor operators will be trained on the importance of avoiding fuel spills during refueling operations. In addition, farm tractor navigation panels are designed with gauges to allow operators to monitor engine operations, including fuel level and oil pressure. Careful attention to these gauges will allow trained operators to prevent most equipment malfunctions that could result in a release to the environment.

All tractors will carry containment and cleanup materials, and operators will be trained to use them in case of leakage or spill. The materials will include a 100-liter drum (or some other size), shovel, paper towels, absorbent media, latex gloves, and safety glasses. The tractor operator will also maintain a spill reporting log to document the time and date of the spill, spill location, size of spill, and containment and cleanup procedures. Spills that cannot be completely cleaned up immediately must be reported to the authorities (any spills that reach surface water also must be reported). All visibly contaminated soil and sediment will need to be excavated and removed. If spills reach surface water, the absorbent media will be used to remove the sheen from the water. The expendable materials used for containment and cleanup would be placed in the drum and transported to an offsite location for disposal in accordance with applicable requirements. The non-expendable materials (for example, the shovel) like the shovel would be cleaned and re-used, and the expendable materials (drum, absorbent media, etc.) would be replenished.

The potential impacts from spills would be relatively minor due to the small amounts of fuel or other materials involved. Overall, the potential for significant impacts from fuel or lubricant spills is considered to be very low if proper procedures are followed.

2.2.2.3 Occupational safety and health

Tractor drivers and ground workers would face potential hazards from slips, trips, and falls; heat; fire; and accidents with tractors or balers. These hazards could lead to injury or death. Before operations begin, Enemona will develop a safety and health program that identifies the potential hazards associated with tractor operations and straw harvest, the safety measures to be implemented, and emergency contact information (including company personnel, police, hospital, and ambulance phone numbers and addresses that can be used to report accidents or seek emergency help). Every tractor driver will be trained in the safety and health program, and this person will brief all other workers at the beginning of each shift.

Workers could suffer from heat stroke or other heat-related conditions if proper precautions are not observed. Tractor operators would be at much lower risk if tractor cabs are air-conditioned; outside workers could be at risk in sunny, hot, and/or humid weather. Every tractor will carry at least one day's supply of potable water for the operator and harvest workers, and there will be frequent breaks in hot weather. In addition, each tractor will be equipped with a fire extinguisher, first aid kit, and cellular telephone or other radio communication device. The nearest local police and emergency responders should be notified at least seven days before harvest operations will be taking place in their area, and advised of the schedule and nature of the operations.

In nearly all cases, the safety program should require the operator to call for help to deal with equipment failures rather than attempting repairs himself or herself. However, tractor operators will be trained to respond to minor equipment breakdowns that occur with the baler or tractor and that can be repaired easily and at low risk (for example, replacing or untangling baling twine). In these cases, the equipment must be completely disengaged prior to conducting the minor repair. The operator's responsibilities regarding the repair of equipment malfunctions will be limited so as to reduce the risk of injury or death.

Tractor drivers and ground workers will be provided with, and required to use, appropriate personal protective equipment. These could include eye protection, hearing protection, gloves and boots, and other equipment as necessary to protect workers.

With these mitigation measures, the potential for significant risks to personnel safety is considered to be very limited. Enemona will appoint an official to be responsible for all safety and health programs, including working with foreman and equipment operators, developing safety plans and ensuring personnel are properly trained, conducting unannounced inspections to verify compliance with the program, and keeping records on training and on each operator's and worker's safety record.

2.2.2.4 Potential impacts on habitat and protected species

Section 3 of this supplementary information identifies 49 designated or proposed Natura 2000 areas that lie partly or entirely within the straw collection area. Some of the protected areas are used for agriculture now, or were in the past. For farm fields that are part of designated Natura 2000 areas, operators will be briefed on boundaries of protected areas and will remain in designated operating areas at all times. This should present any potential impacts in these areas (see section 3.0 for the locations of these areas). In addition, should crops of any kind be planted on lands within Natura areas that are not currently cultivated, Enemona will need to consult with the Regional Inspectorate of Environment and Water to determine if an assessment of compatibility will be required. In addition, Enemona will place an equivalent area of land under permanent protection as mitigation if that is determined to be necessary by the Regional Inspectorate.

2.2.2.5 Economic impacts

As noted above, up to about 90 people will be employed during the straw harvest. The average monthly wage for unskilled agricultural workers in Bulgaria is roughly 250-350 Euros, or about 10 Euros per day. The average monthly wage for askilled workers such as a tractor driver is about 550-650 Euros, or about 20 Euros per day. If there will be 45 unskilled and 45 skilled laborers earning 10 and 20 Euros per day, respectively, the total income each year due to straw harvest employment would be over €60,000. This would have a minor beneficial effect on the regional economy. Table 2-4 summarizes potential increases in personal income. Unemployment in Nikopol municipality has averaged over 35 percent, so even this temporary employment could have a major beneficial impact on at least some households.

Table 2-4. Annual worker income from straw harvest

Type of worker	*Income per day (€)*	*Days per harvest season*	*Income per worker per harvest season*	*Number of workers*	*Total income*
Unskilled	10	45	€ 450	45	€ 20 250
Skilled	20	45	€ 900	45	€ 40 500
Totals				90	€ 60 750

2.2.3 Potential impacts from transporting straw from farms to storage areas

The straw collection area extends 100 kilometers from the plant site. The road network consists primarily of two-lane rural roads that are categorized as first, second, and third grade roads (see Figure 2-1). Most appear to have relatively light traffic. The longest road distance that straw will have to be moved from a farm to one of the storage areas storage is about 120 kilometers (although the straight-line distance is no more than 100 kilometers, the road distance is somewhat more).

For most farms within 10 kilometers of a storage area, straw will be transported in carts pulled by tractors (about 12-14 bales per cart). For more distant farms, straw will be transported by road truck and semi-trailer (44 bales per truckload) or board truck and cart trailer (48 bales per truck/trailer). As previously discussed, a total of 125,000 tonnes (417,000 bales at 300 kilograms per bale) of straw would be transported from farms to the three storage areas during the 45-day harvest period. At an average of 35 bales per trip, a total of 2,778 tonnes (9,260 bales) could be moved to storage each day. This is equivalent to 264 trips per day to the storage areas, or 88 trips per day to each storage area. This in turn means that each hour about eight trucks and tractors will arrive at each storage area and eight will depart – overall, there will be one arrival and one departure every eight minutes.

At an average distance from farm to storage area of 5 kilometers, tractors (assumed to be one-third of the trips) will travel a total of about 19,000 kilometers during the 45-day harvest and collection period; at an average distance of 50 kilometers, trucks would travel a total of about 396,000 kilometers.

Potential impacts would include air emissions from diesel engines; leaks or spills of fuel, oil, or hydraulic fluids that could contaminate soil or water, occupational health and safety; and public health and safety. All would be considered short-term because the harvest season would last only about 45 days per year.

2.2.3.1 Potential impacts on air quality

There would be minor dust generated when trucks drove on unpaved farm tracks while picking up the bales and then again when traveling on the straw storage areas. Once off farms, transportation of the straw from farms to the storage areas would occur mostly or entirely on paved roads. Thus, impacts to air quality from fugitive dust emissions would not be expected. In addition, there could potentially be a small impact to air quality due to vehicle emissions.

Table 2-5 shows estimated vehicle emissions that could occur if the average distance that trucks travel from farm to storage area is 50 kilometers (100-kilometer round trip), with 88 trips per day by tractors, 88 by board trucks, and 88 by road trucks over a 45-day period.. Emissions were estimated using guidance published by the European Environment Agency (2007).

Table 2-5. Air emissions by vehicles transporting straw from farms to storage areas

Type vehicle	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of round-trips*	*Total emissions (kg)*
Board truck	NOx	116.4	45	88	5,240
Road truck		169.4			7,625
Total NOx					12,865
Board truck	CO	33.6	45	88	1,510
Road truck		54.9			2,469
Total CO					3,979
Board truck	NM-VOC	15.0	45	88	677
Road truck		24.6			1,106
Total NM-VOC					1,783

Table 2-5. Air emissions by vehicles transporting straw from farms to storage areas					
Type vehicle	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of round-trips*	*Total emissions (kg)*
Board truck	PM10	5.6	45	88	252
Road truck		7.95			358
Total PM10					610

Vehicle emission data for the project region were not available for comparison to the estimated vehicle emissions from the project. However, calculated emissions for the project are less than comparable U.S. vehicle emissions data. As a result, it is concluded that the impact to air emissions from the road and board truck operations during harvest would be minor. Thus, no mitigation is proposed other than to keep engines in good working order.

2.2.3.2 Potential impacts on soil or surface water

Potential impacts to soil or surface water from the transportation of straw from the farms to the storage areas include fuel or oil releases into the environment during operations or during refueling. Several mitigation measures will significantly reduce the likelihood of a release, and the significance of any release that occurs.

No refueling will the done within 50 meters of a stream, wetland, or other surface water. This will reduce the likelihood that spilled fuel or oil would contaminate water. All drivers and equipment operators will be trained in safe operations, and this should reduce the likelihood of a spill.

In addition, each tractor, road truck, and board truck will be equipped with spill containment and cleanup materials that could be deployed immediately if fuel or oil is released into the environment. Likewise, each road truck and board truck operator will be trained to in spill response. The spill containment and cleanup materials will include a 100-liter drum (or comparable size), shovel, paper towels, absorbent media, latex gloves, and safety glasses. The tractor operator will also maintain a spill reporting log to document the time and date of the spill, spill location, size of spill, and containment and cleanup procedures. Workers would excavate all soil or sediment that was visibly contaminated. If the release is into surface water then the absorbent media will be used to remove the sheen from the water. All expendable materials used for the containment and cleanup would be placed in the 100-litre drum and transported to an offsite location for disposal in accordance with published requirements. The non-expendable materials like the shovel would be cleaned and re-used.

Employee training for spill response will lessen the potential for an uncontrolled release of oil or fuel into the environment. Thus, the potential impact to soil or surface water is anticipated to be small.

2.2.3.3 Potential impacts on occupational health and safety

Potential impacts to employees include slip, trip, and fall hazards, risk associated with heavy lifting of straw bales, heat exposure, fire hazards, and potential interaction with general road traffic resulting in injury or death.

A Safety and Health Plan will be developed and operators will be trained on its content before they begin work. The Safety and Health Plan will identify the potential hazards associated with straw loading and truck operations, the safety measures to be implemented, risk analysis methodology, and emergency contact information (e.g., police, hospital, and ambulance phone numbers and addresses). Safety briefings will be conducted at the

beginning of each shift change. The local emergency responders will be provided a copy of the Safety and Health Plan to become familiar with harvest operations.

Excessive heat exposure to operators would be limited if the truck cabs are air-conditioned; however, potable water containers will be provided as part of the health and safety plan implementation. Each truck will be equipped with a fire extinguisher, first aid kit, and radio communication devices so the operator can respond to emergency situations.

Generally, minimizing potential accidents with the transport trucks will begin with hiring of responsible drivers and providing them appropriate training. The truck drivers will be licensed, permitted, responsible, and aware of their surroundings to minimize the potential for road accidents.

Mitigating potential road accidents will also include coordinating with emergency responders. Drivers will be advised of areas of special concern, which will include schools and other areas where there could be pedestrians, as well as areas with road hazards.

For farms located within 10 kilometers of the storage area tractors could be utilized to transport straw. If that is to occur, tractors will be prohibited from traveling on first grade roads since there is typically more traffic on first grade roads, and this will decrease the potential for road accidents.

The implementation of a safety and health training program would reduce the potential impact to workers associated with transporting the straw from the farm fields to the storage facilities. This program, and implementation by everyone involved in the program, should minimize the potential for accidents and injury.

2.2.3.4 Potential impacts to public health and safety

There would be significant traffic during harvest season, especially at the straw areas. A truck or tractor would enter each straw area 88 times per day for 45 days, or once every 15 minutes, and a tractor would leave each area at the same frequency. So, there would be a large truck or tractor entering or leaving each area every 7 to 8 minutes. Traffic frequency would be reduced as distance from the straw areas increased, and trucks were traveling on the entire road network to reach the roads that pass the straw areas. Even so, there would be some increased potential for road accidents due to the increased road traffic. .

Before each harvest season, Enemona will consult with local officials in villages near the straw storage areas, and also villages where straw will be collected. The purpose will be to inform them about the activities that will be involved and the truck routes to be used. Enemona will work with these officials to improve traffic signage, visibility, and overall safety of roads, particularly along stretches located near schools and other locations where children or other pedestrians. Discussions will include whether additional outreach is needed, to schools or other institutions where there could be heavy pedestrian traffic.

As noted in section 2.2.3.3, truck drivers will be licensed, permitted, responsible, and aware of their surroundings, and this would reduce the probability of road accidents or collisions with other vehicles or pedestrians. Additionally, the drivers will be required to inspect their vehicles prior to mobilization (like making sure the safety light system is operating correctly).

2.2.3.5 Potential impacts to protected areas

Chapter 3 of this supplementary report describes potential impacts in protected areas.

2.2.4 Potential impacts from transporting straw from storage areas to the Nikopol Biomass CHPP

The Nikopoll Biomass CHPP will burn about 110,000 tonnes, or 367,000 bales, of straw per year. Thus, the plant will need up to about 900 to 1,000 bales per day (at a conservative 300 kilograms per bale. Straw will be transported by board trucks (up to 48 bales per trip) at an average of 46 bales per trip from storage area to plant; a total of 21 trips will be needed per day. Thus, there would be one round-trip every 66 minutes, or a truck passing a single place every 33 minutes (that is, one truck delivering straw to the plant and another returning to the storage area for another load). As described in section 2.1, the average distance from straw areas to the plant is about 20 kilometers. Assuming 21 round-trips each day from the storage areas to the plant, transporting straw to the plant would involve a total of about 840 road-miles per day.

The primary impacts from the transportation of straw from the storage areas to the Nikopoll Biomass CHPP would be similar to potential impacts from transportation of straw from the fields to the storage areas, with the exception of air quality and socioeconomics. Therefore, please refer to Subsection 2.2.3 for a discussion of impacts and mitigation procedures associated with soil and surface water, occupational safety and health, public safety and health, and natural areas. Potential impacts on air quality that are associated with transporting straw from the storage areas to the CHPP are described in the following paragraphs.

2.2.4.1 Potential impacts on air quality

It is assumed the transport trucks would travel on paved roads from each storage area to the Nikopoll Biomass CHPP. Thus, there would only be very minor fugitive dust emissions associated with transporting straw from the storage sites to the plant.

In addition to 21 round-trips each day, 365 days each year, vehicle emissions for transporting the straw from the storage locations to the Biomass CHPP are based upon an average, round-trip travel distance of 40 kilometers from Gulyantsi, 37 miles from Asenovo, and 43 miles from Novachene. Table 2-6 lists the estimated emissions for the board trucks and road trucks working to transport straw from the storage areas to the Nikopoll Biomass CHPP. Emissions were estimated using guidance published by the European Environment Agency (2007).

Table 2-6. Annual air emissions by vehicles transporting straw from storage areas to Nikopoll Biomass CHPP

Storage Location	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of round-trips*	*Total annual emissions (kg)*
Gulyantsi	NOx	11.1	365	21	4,057
	CO	3.2			1,169
	NM-VOC	1.4			524
	PM10	0.53			195
Total Emissions					5,945
Asenovo	NOx	26.6	365	21	3,753
	CO	0.04			13
	NM-VOC	1.3			485
	PM10	0.50			181
Total Emissions					4,432

Table 2-6. Annual air emissions by vehicles transporting straw from storage areas to Nikopoll Biomass CHPP					
Storage Location	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of round-trips*	*Total annual emissions (kg)*
Novachene	NOx	11.9	365	21	4,361
	CO	3.4			1,257
	NM-VOC	1.5			564
	PM10	0.58			210
Total Emissions					6,392

As noted above, vehicle emission monitoring data for the project region are not available for comparison to estimated project emissions. However, these estimated emissions are lower than comparable U.S. vehicle emissions data. Therefore, it is expected that the impact to air quality due to transporting straw storage areas to the plant would be minor. The only required mitigation would be to keep trucks in good working condition.

2.2.4.2 Socioeconomics

The exact number of truck drivers and workers to help load and unload straw is not known, but will be sufficient to allow 21 trips per day from the three straw areas. Similarly, the workers' income is not known, but is expected to be about €550-€650 per month for truck drivers and about €250-€350 per month for other workers. Wages paid to drivers and workers will be no less than the Bulgarian average for similar occupations, or the regional average, whichever is higher.

2.2.5 Potential impacts from construction and operation of base camp

The vehicle maintenance facility will comprise a production base for manufacturing, servicing, and repair of non-standard equipment and as a base for servicing and repairing trucks, agricultural machinery, and equipment. As shown on Figure 2-3, the base camp is bounded by residential buildings to the north; a military building to the east; agricultural building to the west; and meadows to the south.

Potential impacts from construction and operation of the vehicle repair and maintenance base camp include those associated with noise and aesthetics, soil and water quality, air quality, socioeconomics, public health and safety, and occupational health and safety.

2.2.5.1 Noise and aesthetics

The impact to ambient noise levels from construction and operation of the vehicle maintenance facility would be intermittent and limited to day-time working hours. Construction of the vehicle maintenance facility would result in potential noise level increases from operating vehicles and equipment. As with construction of the straw storage facilities, construction and operations equipment for the vehicle maintenance facility will be powered with diesel engines that generally operate at approximately 100 decibels (dB) or less. Noise rapidly attenuates with distance from the noise source. At only 100 meters away from a 100 dB noise source, a listener experiences a 49 dB sound level (normal conversation is typically at 70 dB). However, equipment will be maintained and in good working condition to ensure equipment noise levels are not excessive. Therefore, construction and operational noise should only occasionally represent a very short-term, intermittent nuisance to nearby residents, and then only to the closes ones.

As required by Bulgarian authorities, a noise barrier will be erected around the facility to enhance noise attenuation. This noise barrier will be either natural (such as trees) or man-

made (such as a fence or wall). In addition to this barrier, it will also reduce potential aesthetic impacts associated with a commercial facility being located near a residential area.

2.2.5.2 Soil and water quality

Potential temporary impacts to surface water from the construction and operation of the vehicle maintenance facility would include stormwater runoff as well as fuel, oil, or chemical spills associated with refueling or with vehicle or equipment leaks. There would be a long-term impact to soils from construction and operation of the vehicle maintenance facility. Earth moving necessary to construct the vehicle maintenance facility will require the excavation and manipulation of soil materials from their existing location, and remaining soils will be covered by an impervious surface.

A primary concern with storm water runoff from a construction site is the loss of soil and the impact of soil on water quality. If there is any potential for soil erosion, this will be minimized by the use of good housekeeping practices, erosion and sediment control best management practices (for example, silt fences along all waterways, straw bales, check-dams, seeding), inspections and maintenance, and training. The construction foreman will be responsible for erosion control.

Enemona will prepare a plan to prevent and control spills during construction and operations. This plan will require an inventory and tracking system for delivery, use, and disposal of fuel, oil, chemicals, and wastes on the site, and will identify secondary containment or control measures, personnel safety, spill response measures, emergency phone numbers and contact names. Employees will be trained in the handling of fuel, oil, and chemicals that are stored or used on site, and in responding to spills. Implementation of the plan will require routine inspection and maintenance activities to ensure good housekeeping practices are being used. Again, the foreman will be responsible for implementation of the spill plan. In general, the base camp will comply with all storage, use, and disposal requirements associated with used oil, used solvents, used chemicals, and other hazardous wastes. The development and careful implementation of these plans will reduce potential impacts associated with construction and operation of the vehicle maintenance facility.

2.2.5.3 Air Quality

The primary effect on air quality would be from vehicle emissions. It is assumed there would be 60 road trucks, 60 board trucks, 60 heavy-duty tractors, and 60 medium-duty tractors sent to the maintenance shop one time each year, and that they would travel an average round-trip of 70 kilometers. Table 2-7 lists the estimated emissions associated with the road trucks and board trucks. Table 2-8 lists the estimated emissions associated with the heavy-duty and medium-duty tractors, respectively. Emissions were estimated using European Environment Agency (2007).

Table 2-7. Air emissions by vehicles traveling to Belene vehicle maintenance facility

Type vehicle	*Pollutant*	*Emissions per day (kg)*	*Number of trucks*	*Number of days/round-trips*	*Total emissions (kg)*
Board truck	NOx	1.38	60	1	83
Road truck		0.93	60		56
Total NOx					139
Board truck	CO	0.44	60	1	26.5
Road truck		0.27	60		16
Total CO					42.5

Table 2-7. Air emissions by vehicles traveling to Belene vehicle maintenance facility					
Type vehicle	*Pollutant*	*Emissions per day (kg)*	*Number of trucks*	*Number of days/round-trips*	*Total emissions (kg)*
Board truck	NM-VOC	0.2	60	1	12
Road truck		0.12	60		7.2
Total NM-VOC					19.2
Board truck	PM10	0.11	60	1	6.5
Road truck		0.045	60		2.7
Total PM10					9.2

Table 2-8. Air emissions by tractors traveling to Belene maintenance facility					
Type tractor	*Pollutant*	*Emissions per day (kg)*	*Number of days*	*Number of tractors*	*Total emissions (kg)*
Heavy-duty	NOx	1.38	60	1	83
Medium-duty		0.93	60		56
Total NOx					139
Heavy-duty	CO	0.45	60	1	27
Medium-duty		0.27	60		16
Total CO					42
Heavy-duty	NM-VOC	0.2	60	1	12
Medium-duty		0.12	60		7
Total NM-VOC					19
Heavy-duty	PM10	0.11	60	1	7
Medium-duty		0.045	60		3
Total PM10					10

As noted previously, vehicle emission monitoring data for the project region are not available for comparison to the estimated vehicle emissions from the project; however, the estimated emissions listed in Tables 2-7 and 2-8 are lower than comparable U.S. vehicle emissions data, so the impact to air emissions from trucks and tractors going to the Belene maintenance shop are anticipated to be very minor.

2.2.5.4 Socioeconomics

The construction and operation of the vehicle repair and maintenance base camp will have a positive socioeconomic impact directly for the employees and indirectly for area businesses. Construction will require design engineers, equipment operators, and material suppliers. Likewise, operation of the repair facility will include administration and management personnel, diesel engine mechanics, locksmiths, agriculture equipment repair technicians, welders, and general technicians.

The construction and operation of the repair facility is anticipated to create some number of new jobs; the number is not known, but is likely to exceed 20 temporary jobs for construction and 10 or more permanent jobs for operation. Positions will be advertised and filled with local workers where possible. Overall, this additional employment will result in a positive

impact to businesses in the area because the repair facility construction and operation employees will live in the area and spend money at area businesses. In addition, Enemona will purchase fuel and supplies from area vendors Therefore, there would be a positive socioeconomic impact associated with the construction and operation of the repair facility. The magnitude is unknown but would be minor to moderate locally and very minor on a larger scale.

2.2.5.5 Public Health and Safety

Potential impacts to public safety would generally include collisions or accidents involving transport vehicles. To reduce the probability of impacts, all truck and tractor drivers will be licensed, permitted, responsible, and aware of their surroundings to minimize potential interaction with pedestrians or other vehicles. Additionally, all drivers will be required to inspect their vehicles prior to mobilization (for example, verifying that the safety light system is operating correctly). Enemona also will consult with Belene authorities to improve traffic signage, visibility, and overall safety of roads, particularly roads that pass schools and other locations where children may be present.

2.2.5.6 Occupational Health and Safety

Potential impacts to workers include slip, trip, and fall hazards, risk associated with heat exposure, fire hazards, and potential interaction with general road traffic resulting in injury or death.

A Safety and Health Plan will be developed and operators will be trained on its content. The Safety and Health Plan will identify the potential hazards associated with truck operations, the safety measures to be implemented, risk analysis methodology, and emergency contact information (e.g., police, hospital, and ambulance phone numbers and addresses). Employees will be trained regarding the implementation of the Safety and Health Plan.

Excessive heat exposure to operators would be limited if the truck and tractor cabs are air-conditioned; however, potable water containers will be provided as part of the health and safety plan implementation. Each truck and tractor will be equipped with a fire extinguisher, first aid kit, and radio communication devices so the operator can respond to emergency situations.

Generally, minimizing potential accidents with trucks and tractors will include the hiring of responsible drivers and appropriate training. All drivers will be licensed, permitted, responsible, and aware of their surroundings to minimize the potential for road accidents. In addition, Enemona will limit access to the base camp area so that trespassing is minimized.

2.2.6 Potential noise impacts of plant construction and operation

Construction of the plant will take some time, possibly over 12 months. During that time, there would be noise from heavy equipment and machinery, truck traffic, and general construction-related noise such as hammering and other activity. There are no residents within about two kilometers, so there should be limited or no impacts on residents. Construction will take place only during daylight hours, so will not disturb quiet nighttime hours, when noise can be heard farther away. In summary, noise may be audible to passing motorists, to customers and workers at the nearby petrol station, to occupants at the small hotel across the road, and to workers at the paper/cardboard factory. As with construction of the straw storage facilities and the Belene base camp, construction and operations equipment for the vehicle maintenance facility will be powered with diesel engines that generally operate at approximately 100 decibels (dB) or less. Since noise rapidly attenuates with distance from the noise source, as described above, noise should not be disturbing to anyone unless there are occasional louder noises during construction. All equipment will be maintained and in good working condition to keep noise levels to a minimum. During plant

operation, straw delivery and unloading will generate the loudest noises, and these should be barely audible off-site. As required by Bulgarian authorities, a noise barrier such as a fence or wall will be erected around the site and will be 2.5 to 3 meters high. In addition to reducing noises, it will also reduce potential aesthetic impacts associated with a commercial facility being located in a rural area. The detailed development plan also calls for no construction within five meters of the site boundaries, and this will provide room for a green belt of trees. (This plan was adopted by the Expert Council on Territory in the municipality of Nikopol inJuly 2009.) In general, noise from construction of the plant will be intermittent and minor, and noise from operation will be long-term but minor.

2.2.7 Summary of potential impacts

Table 2-9 summarizes the potential impacts described in previous sections. Measures to avoid, reduce, or otherwise mitigate potential impacts are summarized in Chapter 6 of this supplementary report. The most serious potential impacts would be to occupational and public health and safety, in part due to increases in road traffic. In summary, with proper mitigation, all potential impacts should be minor or negligible.

Table 2-9. Summary of potential impacts from straw program

Environmental Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Magnitude of Impact and Duration*	*Significance*
Air quality				
Residents and general population	Low	Fugitive dust generation during construction	Low, temporary	Negligible Adverse
Residents and general population	Low	Vehicle emissions during construction and operation, and during transport	Low, long-term	Negligible adverse
Soil and water quality				
Aquatic organisms	Medium	Erosion of soil into surface water	Low, intermittent	Minor adverse
Aquatic organisms	Medium	Spills of fuel, oil, or chemicals onto soil or into water	Medium, rarely	Minor adverse
Noise				
Residents near straw storage areas	High	Construction noise, vehicle noise during loading/unloading	Medium, long-term	Minor adverse
Residents near plant	High	Vehicle noise and straw unloading noise	Minor, long-term	Minor adverse
Residents near base camp	High	Vehicle noise, operations noise (hammering, etc.)	Minor, long-term	Minor adverse
Transportation				
Road travelers	Low	Congestion near straw storage areas during harvest	High, Periodic	Moderate adverse
Road travelers	Low	Congestion near plant	Minor, long-term	Minor adverse
Road travelers	Low	Increase in road traffic throughout harvest season	Minor, medium-term	Minor adverse

Table 2-9. Summary of potential impacts from straw program				
Environmental Receptor	*Sensitivity of Receptor*	*Potential Impact*	*Magnitude of Impact and Duration*	*Significance*
Socioeconomic				
Local and regional economy	Moderate	Direct and indirect contributions to economic activity	Minor, long-term	Minor beneficial
Local workers (individual basis)	High	Temporary employment opportunities (≈90 workers for 45 days per year)	Major, temporary	Major beneficial
Local workers (individual basis)	High	Permanent employment opportunities (possibly >25)	Major, long-term	Major beneficial
Occupational health and safety				
Workers	High	Slips, trips, falls, accidents	High, intermittent (continuous risk, intermittent events)	Major adverse
Public health and safety				
Pedestrians	High	Collisions with vehicles	High, intermittent	Major adverse
Nearby residents	High	Exposure to chemicals, noise, etc.	Minor, long-term	Moderate adverse
Protected areas				
Flora and fauna	High	Conversion of land to cultivation for straw	Major, long-term	Moderate adverse
Flora and fauna	High	Truck accident or spill while carrying straw across Natura area	Major, rarely	Moderate adverse
Flora	High	Fauna collision with truck	Major, rarely	Minor adverse

3.0 OVERVIEW OF POTENTIAL IMPACTS ON NATURA 2000 AREAS

Natura 2000 is a network of nature conservation sites for the 21st century. Sites are identified as worthy of protection by European Union member countries pursuant to European Commission Directives 92/43 (the Habitats Directive) and 79/409/EEC (the Birds Directive). The Habitats Directive is intended to preserve biodiversity through the conservation of natural habitats of wild fauna and flora of EU countries. The Birds Directive is intended ensure conservation of wild birds, both breeding birds and migratory birds.

At the time of accession, new member countries must have transposed the Directives into national law, nominated proposed Sites of Community Importance under the Habitats Directive, and designated Special Protection Areas under the Birds Directive. Some areas may be designated under both Directives. As a new member of the European Union, Bulgaria only recently began the process of nominating and designating areas, so some sites described in this section have been nominated but not yet formally designated for protection and others have been fully designated.

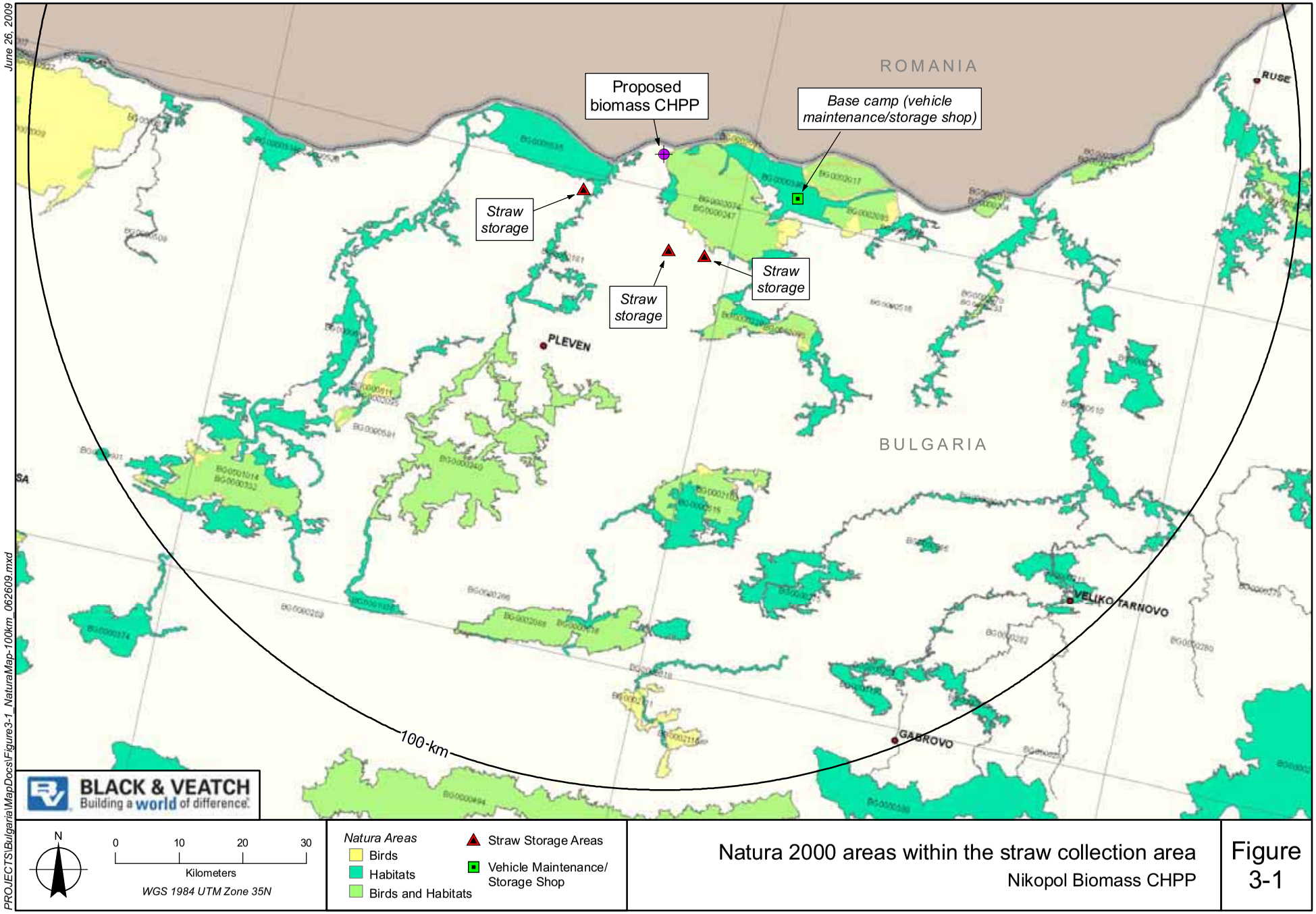
Bulgarian regulations require that the compatibility of any project with a Natura area that may be affected by a project must be evaluated before it can be approved. For the Nikopol CHPP, Enemona submitted to the Pleven Regional Inspectorate of Environment and Water "Report on the Appraisal of Compatibility of an Investment Proposal" as Appendix 11 of the *Environmental Impact Assessment Report for Nikopol Combined Heat Power Plant* (Enemona 2009). The compatibility report evaluated potential impacts on the two Natura areas that could be directly affected by the CHPP Nikopol: Persina protected habitat area (BG0000396) and Nikopol Plateau bird habitat area (BG0002074). The plant site lies within the Nikopol Plateau bird protection area, as does the Novachene straw collection area. In addition, part of plant site lies within the Persina area. To mitigate potential impacts of the plant on these areas, Enemona will build a levee where the plant site borders the River Osam. The purpose is to prevent harmful impacts and preserve biodiversity. For the same reasons, Enemona will use water from the Danube Region Basin Directorate in Pleven. In addition, Enemona will place an equivalent area of land under permanent protection as mitigation.

Besides the potential impacts of the power plant itself, the straw program could affect any of the Natura areas within 100 kilometers of the plant. The straw collection area includes all or parts of 49 nominated or designated Natura areas, as shown on Figure 3-1. This section describes the protected areas within the straw collection area and provides an overview of the types and magnitude of impacts that could result from construction and operation of CHPP Nikopol and the straw collection and transport program. Table 1 shows the Natura areas within the straw collection area. The table also shows the identification number of the area, the length of roads within the area, and the distances from the area to the straw storage areas and the CHPP.

3.1 Natura 2000 sites within the straw collection area

This section describes each of the 49 Natura areas that lie partly or entirely within the straw collection.

Upper Dubnik - Telish (Site BG0002095) covers an area of 3398.34 hectares and was designated a Natura site as a protected zone of the Birds Directive, and it also overlaps a protected zone of the Habitats Directive. It provides excellent to good habitat to a large number of bird species that inhabit the area year round, use it for migration, wintering, reproduction, or molting. Seventy-five species are established, of which 34 are listed in Bulgaria's Red Book and 41 are species of European environmental significance. The site contains a variety of water and wetlands habitats. The site's proximity to water creates several ecological niches for water and water-related species. Forty percent of the area is



Natura 2000 areas within the straw collection area

Nikopol Biomass CHPP

Figure 3-1

Table 3-1. Natura 2000 sites within the straw collection area									
Natura Area	*Code*	*Bulgarian Name*	*Area (ha)*	*Area type*		*Straight-line distance to:*			
					Roads within Natura area (km)	*Gulyantsi-Milkovitsa straw area (km)*	*Asenovo straw area (km)*	*Novachene straw area (km)*	*Nikopol CHPP (km)*
Vit River	BG0000181	Река Вит	5,717.2	Birds	39.4	0.5	13.8	18.8	8.7
Vitata stena	BG0000190	Витата стена	2,630.2	Birds	8.1	84.1	70.0	67.3	84.4
Vardim Island (habitat)	BG0000204	Вардим	1,104.9	Habitat	0.0	60.4	47.2	41.8	48.5
Tarnovski heights	BG0000213	Търновски височини	4,434.6	Birds	55.4	89.7	73.4	68.8	84.9
Dryanovo Monastery	BG0000214	Дряновски манастир	2,987.9	Birds	13.0	93.0	77.6	73.9	91.0
Emen	BG0000216	Емен	490.4	Habitat	0.0	76.3	60.3	56.1	72.9
Batin	BG0000232	Батин	2,691.1	Habitat	8.6	74.4	62.0	56.6	61.9
Cold River	BG0000233	Студена река	5,301.6	Habitat	78.8	59.1	43.0	37.5	51.0
Obnova - Karaman dol	BG0000239	Обнова - Караман дол	10,750.8	Habitat	51.1	26.7	10.4	5.7	20.9
Studenetz	BG0000240	Студенец	28,050.7	Both	91.3	26.7	24.5	26.9	37.9
Nikopol Plateau (habitat)	BG0000247	Никополско плато	18,503.2	Habitat	45.0	10.3	4.1	0.2	3.2
Skalsko	BG0000263	Скалско	2,189.5	Birds	8.1	86.0	71.6	68.7	85.9
Cave Swallow	BG0000269	Пещера Лястовицата	1.0	Habitat	0.0	80.7	81.9	85.3	92.6
Stamboliyski Dam	BG0000275	Язовир Стамболийски	9,355.6	Birds	50.6	63.9	50.3	48.1	65.0
Dryanovo River	BG0000282	Дряновска река	183.2	Birds	8.0	95.8	79.7	75.4	91.9
Karlukovski Karst	BG0000332	Карлуковски карст	14,208.7	Birds	133.7	66.0	70.3	74.6	78.9
Ostrov	BG0000334	Остров	3,439.6	Habitat	17.4	44.6	59.3	65.0	57.1

Table 3-1. Natura 2000 sites within the straw collection area									
Natura Area	*Code*	*Bulgarian Name*	*Area (ha)*	*Area type*		*Straight-line distance to:*			
					Roads within Natura area (km)	*Gulyantsi-Milkovitsa straw area (km)*	*Asenovo straw area (km)*	*Novachene straw area (km)*	*Nikopol CHPP (km)*
Karaboaz	BG0000335	Карабоаз	12,200.4	Birds	23.1	1.2	15.5	20.4	9.6
Persina	BG0000396	Персина	22,404.5	Habitat	78.1	12.3	11.2	9.4	0.1
River Reserve	BG0000508	Река Скът	408.6	Birds	14.0	67.6	81.2	86.9	80.2
Black hill	BG0000516	Черната могила	13.1	Habitat	0.0	50.9	35.1	29.4	42.3
Ostrovska step - Vadin	BG0000528	Островска степ - Вадин	301.3	Habitat	1.8	37.0	51.9	57.6	49.4
Kozlodui Islands	BG0000533	Острови Козлодуй	605.8	Habitat	0.0	71.6	86.9	92.6	83.2
Svishtovska Montenegro	BG0000576	Свищовска гора	1,917.2	Birds	38.3	44.3	29.7	24.1	34.3
Rositsa River	BG0000609	Река Росица	1,440.9	Birds	10.8	66.3	50.9	47.2	64.2
Yantra River	BG0000610	Река Янтра	13,900.4	Birds	119.1	68.2	55.2	49.8	56.0
Dam Upper Dubnik	BG0000611	Язовир Горни Дъбник	2,539.3	Habitat	34.1	41.2	46.7	51.5	54.2
River Iskar	BG0000613	Река Искър	9,458.0	Birds	34.2	21.0	33.9	39.5	34.2
River Ogosta	BG0000614	Река Огоста	1,253.2	Habitat	15.0	63.7	78.8	84.5	75.5
Devetashko plato	BG0000615	Деветашко плато	14,998.1	Habitat	29.7	47.3	34.9	33.8	49.9
Micro	BG0000616	Микре	15,447.2	Habitat	35.9	57.3	49.4	50.2	63.8
Visible	BG0000618	Видима	1,823.1	Habitat	20.3	75.8	65.1	64.3	80.0
Karlukovo	BG0001014	Карлуково	28,841.9	Habitat	87.6	54.7	60.3	64.9	67.8
English Well	BG0001036	Български извор	2,619.0	Habitat	29.6	62.6	64.1	67.8	74.5
Golden	BG0002009	Златията	43,494.4	Birds	32.0	71.8	86.7	92.4	83.9

Table 3-1. Natura 2000 sites within the straw collection area									
Natura Area	*Code*	*Bulgarian Name*	*Area (ha)*	*Area type*		*Straight-line distance to:*			
					Roads within Natura area (km)	*Gulyantsi-Milkovitsa straw area (km)*	*Asenovo straw area (km)*	*Novachene straw area (km)*	*Nikopol CHPP (km)*
Belene Islands Complex	BG0002017	Комплекс беленски острови	6,897.0	Birds	0.0	33.2	22.7	18.4	20.7
Vardim Island (bird)	BG0002018	Остров Вардим	1,168.0	Birds	0.0	60.6	47.5	42.1	48.6
Mechka Fish-ponds	BG0002024	Рибарници Мечка	2,738.0	Birds	8.6	75.9	63.4	58.0	63.4
Lomovete	BG0002025	Ломовете	3,408.0	Birds	1.4	103.3	90.6	85.1	90.5
Hadzi Dimitrovo Fish-ponds	BG0002070	Рибарници Хаджи Димитрово	446.5	Birds	6.4	62.7	47.1	41.4	53.5
Nikopol Plateau (bird)	BG0002074	Никополско плато	22,260.2	Birds	50.8	12.2	2.9	0.2	0.1
Svishtovsko-Belenska Lowland	BG0002083	Свищовско-Беленска низина	5,441.0	Birds	56.9	36.6	23.5	18.4	25.6
Mikre	BG0002088	Микре	12.386,98	Birds	29.9	66.5	57.0	57.0	71.9
Lakat Island	BG0002091	Остров Лакът	1,260.9	Birds	0.0	20.8	17.4	16.8	7.1
Upper Dubnik - Telish	BG0002095	Горни Дъбник-Телиш	3,398.3	Birds	34.1	41.4	46.8	51.5	54.4
Obnova	BG0002096	Обнова	5,421.9	Birds	40.7	26.8	10.6	7.1	24.2
Devetashko Plateau	BG0002102	Деветашко плато	7,892.9	Birds	27.4	47.0	34.4	33.2	49.4
Vasilyovska Mountain	BG0002109	Васильовска планина	45,471.9	Birds	111.0	73.4	70.2	71.6	83.4
Apriltsi	BG0002110	Априлци	1,942.6	Birds	2.4	86.5	75.7	74.9	90.7
Velchevo	BG0002111	Велчево	2,310.3	Birds	14.1	79.2	69.1	68.6	84.0

inland water, 39 percent is cereal crops, 8 percent is shrub communities, and the balance is broadleaf deciduous forest, cultivated trees, other arable land, and other land. The site is sensitive to human activities, including use of the lake, poaching, invasion by non-native species, agricultural pollutants, and water extraction for irrigation.

Obnova (Site BG0002096) covers an area of 5421.88 hectares and was designated a Natura site as a protected zone of the Birds Directive. This site overlaps a protected zone of the Habitats Directive. This area contains important wetlands habitat for migrating and wintering waterfowl as well as many protected or threatened species. Fifty-one percent of the area is covered with cereal crops, 16 percent is dry grasslands and steppes, 9 percent is broadleaf deciduous forest, 7 percent is wet meadows, and the rest is other land, other arable land, cultivated tree vegetation, and bare earth and snow. The area is vulnerable to agricultural pollutants and water level changes.

Devetashko Plateau (Site BG0002102) covers an area of 7892.91 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. Thirty-five percent of the area is covered by broadleaf deciduous forest, 21 percent is cereal crop, 15 percent is dry grasslands and steppes, 10 percent is shrub communities, and the balance is forest monocultures, wetlands, other arable lands, other land, bare land and snow, and cultivated trees. The area provides habitat for 78 bird species, including many threatened and endangered species, and is considered to be one of the most important EU locations for eagle nesting. The site is a karst plateau with caves, pools, and precipices. Some of the largest caves and cave complexes are found here. Forests occupy one-third of the territory. The rock complexes are habitat to several rare and threatened bird species. The area is vulnerable to mowing associated with traditional use of meadows, pastures, and forests; illegal landfills; and agricultural pollutants.

Belenski Islands Complex (Site BG0002017) covers an area of 6897.03 hectares and was designated a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. This site is a river island with willow, marsh, and swamp communities. The area is an important habitat for nesting, feeding, and resting waterfowl, with 141 species known at this location, including threatened and endangered species. Twenty-eight percent of the area is covered with cereal crops, 24 percent with broadleaf deciduous forest, 24 percent with inland water, and 17 percent with forest monocultures. The balance is dry grasslands and steppes, and other land. The site contains freshwater marshes and islands covered with forests, which are dependent upon the water regime. Some of the island is covered with meadows, and a portion is also sandy. The area is vulnerable to water composition changes.

Lakat Island (Site BG0002091) covers an area of 1260.94 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. This area provides important habitat for various waterbirds, including multiple endangered species. Sixty-two percent of the area is inland water, 23 percent is broadleaf deciduous forest, 14 percent is shrub communities, and the remainder is other arable land. The site contains several islands which are important for supporting endangered waterbird species. The site is vulnerable to forestry activities and intensive fishing, which affect the riparian habitat. Poaching is also a problem. Hydrological changes of the Danube associated with transportation could cause the shallow waters around the island to disappear, affecting the bird habitat.

Nikopolsko Plateau (Site BG0002074) covers an area of 22260.24 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. This site provides habitat for 92 bird species, many of which are threatened and endangered. Fifteen rare endemic plant species also live in this location. Much of the plateau is occupied by agricultural lands and grasslands, with 42 percent used for cereal crops, 15 percent dry grasslands and steppes, 13 percent broadleaf

deciduous forest, 10 percent other arable land. The remainder is cultivated trees, other land, shrub communities and wetlands. Many rock formations exist in this area, and the site also contains former river channels, wet and meadows. The site is one of the most important in the country for conservation of several bird species. The site is easily accessible, and grazing occurs near settlements. The area is vulnerable to quarrying, poor waste management, invasive species, industrial development, poaching, poor waste management, and off-road vehicle activities. Fire and invasion of non-native species has affected the forested regions, and tree felling may lead to destruction of riparian forests.

Svishtovsko-Belenska Valley (Site BG0002083) covers an area of 5440.98 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. Past periodic flooding of this area has created a complex of natural wetlands with rich flora and fauna. This is an important habitat and migratory stop for 32 species, including threatened and endangered species. The site is 67 percent other arable land, and 22 percent cereal crops. The balance is other land, shrub communities, and dry grasslands and steppes. The valley is adjacent to an industrial zone and is vulnerable to urbanization, dumping, and agricultural pollutants. A planned nuclear plant to the north is expected to impact habitat and bird habits. Eutrophication is a concern in the swamp area.

Hadzi Dimitrovo Fish-ponds (Site BG0002070) covers an area of 446.53 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. This site provides important resting, feeding, migration, and wintering habitat to 116 bird species, some of which are protected. The site consists of 40 percent water, 16 percent dry grasslands and steppes, 14 percent cereal crops, 14 percent wetlands, and the rest is other land, bare rock, and shrub communities. This area has a significant extent of water plants, with poplar and willows. The most serious impact on aquatic habitats is the drainage of fish pools for aquaculture and removal of aquatic vegetation. Pesticides and fertilizers also degrade water quality. Hunting is also a concern.

Vit River (Site BG0000181) covers an area of 5717.17 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. The area provides habitat for important mammals, reptiles, amphibians, fish, and invertebrate species. The river is an important fish corridor, and 44 species are found in this area. The site contains a system of marshes, alluvial forests, and steppe communities. The site is 50 percent dry grasslands and steppes, 23 percent other arable land, 18 percent broadleaf deciduous forest, and the balance is shrub communities, cultivated trees, other land, and water. The area is vulnerable to water pollution and poaching.

Vardim Island (Site BG0000204) covers an area of 1104.89 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. The area provides important habitat for birds, reptiles and amphibians, fish, and invertebrates, many of which are protected. The site is 36 percent other arable land, 30 percent shrub communities, 18 percent water, 14 percent broadleaf deciduous forest, and the remainder is sandy beaches. This site is the third largest of the Bulgarian Danube islands, characterized by sandy banks, and willow and deciduous forests. It is occasionally flooded. The area is vulnerable to flooding, forest clearing, and reforestation with nonnative species.

Cold River (Site BG0000233) covers an area of 5301.57 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. The area provides important habitat for invertebrates, plants, birds, reptiles and amphibians, and fish, many of which are rare and endangered. The area is 42 percent dry grasslands and steppes, 37 percent other arable land, and the balance is broadleaf deciduous forest, other land, shrub communities, and cultivated trees. The area is characterized by open and low hilly areas with steppe vegetation. This habitat is of

particular importance to migratory waterbirds as well as invertebrates. The site is vulnerable to poaching and destruction of habitat due to farming and replacement of trees with nonnative species.

Obnova — Karaman Dol (Site BG0000239) covers an area of 10750.81 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. This area provides important habitat for birds, mammals, reptiles and amphibians, fish, and invertebrates. The area consists of 43 percent other arable land, 38 percent grasslands and steppes, 11 percent broadleaf deciduous forest, and the remainder is shrub communities, other land, and water. This is a former river floodplain surrounded by slopes covered with steppe vegetation and oak forests, some of which are the last surviving red oak forests. The site provides habitat for many rare species of flora and fauna and is a migration point for birds. IT is the most important place in Bulgaria for European waterclover (*Marsilea quadrifolia*) and one of the most important sites for English oak (*Quercus robur*) It is threatened by woodcutting and changes to the hydrological regime.

Studenetz (Site BG0000240) covers an area of 28050.66 hectares and was designated a Natura site as a protected zone of the both the Birds and Habitats Directives. The area consists of 36 percent dry grasslands and steppes, 29 percent broadleaf deciduous forest, 22 percent other arable land, and the remainder is shrub communities, other land, cultivated trees, and water. This is typical karst topography with many caves, caverns, and underground streamflow. These caves are home to many bats. The complex landscape creates at least 15 types of habitat for flora and fauna. There are extensive haymaking meadows and there is pressure from cultivation and tree felling. The area is vulnerable to illegal hunting, and building. The bats are highly vulnerable during hibernation and breeding from spelunkers.

Nikopolsko Plateau (Site BG0000247) covers an area of 18503.18 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. This area provides important habitat for mammals, amphibians and reptiles, birds, fish, invertebrates, and plants. The site consists of 41 percent other arable land, 19 percent broadleaf deciduous, 18 percent dry grasslands and steppes, and the remainder is shrub communities, cultivated trees, and other land. This area is a karst plateau with steppe vegetation, characterized by caves, deciduous forests, vineyards, and wheat fields. The site has the most important role in Bulgaria for conservation of multiple species, including rare and protected ones. The area is vulnerable to habitat destruction due to illegal quarrying, pollution due to agriculture, tree felling, and importation of non-indigenous species.

Karaboaz (Site BG0000335) covers an area of 12200.36 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. This area provides habitat for mammals, fish, reptiles and amphibians, and invertebrates. The site consists of 78 percent other arable land, and the balance is forest monocultures, dry grasslands and steppes, shrub communities, salt marshes, and broadleaf deciduous forests. This area is a large floodplain area, containing the largest forest flooding on the Danube, and it is a major area for temporary marshes, sand dunes, and meadows which provides high diversity in flora and fauna. The area is vulnerable due to human-induced changes in soil salinity and extraction of sand and gravel.

Persina (Site BG0000396) covers an area of 22404.52 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. The site provides important habitat for mammals, amphibians and reptiles, fish, invertebrates, plants, and birds, many of which are threatened and endangered. The site consists of 51 percent other arable land, 16 percent water, 11 percent shrub communities, and the rest is broadleaf deciduous forests, wetlands, other land, dry grasslands and steppes, and cultivated trees. The largest island in the Bulgarian Danube and more than ten other islands are included in this site. The floodplain contains willow,

poplar, and oak forest. There are three swamps in the site. The wetlands provide refuge for waterfowl, but drying of the marshes has reduced their population. The site is vulnerable to logging and poaching.

Svishtovska Montenegro (Site BG0000576) covers an area of 1917.2 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides important habitat for reptiles and amphibians, invertebrates, and plants. The site consists of 52 percent broadleaf deciduous forest, 23 percent other arable land, 18 percent dry grasslands and steppes, and the rest is cultivated trees, other land, and shrub communities. The site is an important forested corridor and also contains steppe grasslands. The area is vulnerable due to logging.

Black Hill (Site BG0000516) covers an area of 13.07 hectares and was designated a Natura site as a protected zone of the Habitats Directive. It provides important habitat to reptiles and amphibians, plants, and invertebrates that are rare and endangered, some of which are of relict origin. The site consists of 54 percent bare rock, 41 percent other land, and the rest is shrub communities. The area is a small basalt hill with some loess cover at the margins. The area includes pasture and steppe grasslands, some of which are protected. The area is vulnerable due to quarrying and grass mowing or harvesting.

Ostrovska Step - Vadin (Site BG0000528) covers an area of 301.29 hectares and was designated a Natura site as a protected zone of the Habitats Directive. It is an important habitat for reptiles and amphibians and plants. The site consists of 73 percent dry grasslands and steppes, 18 percent shrub communities, and the rest is cereal crops, forest monocultures, and cultivated trees. This is a major site for preserving steppe vegetation and is one of the last steppe reserves along the Danube. The open landscape supports arable land and orchards and is heavily affected by human activity and grazing.

Dam Upper Dubnik (Site BG0000611) covers an area of 2539.29 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. It provides important habitat for mammals, fish, invertebrates, reptiles and amphibians, and birds. The site includes 30 percent other arable land, 12 percent shrub communities, 12 percent other land, and the rest is broadleaf deciduous forests and dry grasslands and steppes. This area contains two large lakes that have great importance for nesting, wintering, and migrating birds. Aquatic habitats have been altered due to human activity, and coastal habitats are vulnerable to lake water level, which is controlled by fishing and industry.

River Iskar (Site BG0000613) covers an area of 9458 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides important habitat for mammals, reptiles and amphibians, fish, invertebrates, and birds. The area includes 25 percent dry grasslands and steppe, 18 percent cereal crops, 15 percent broadleaf deciduous forest, 15 percent forest monocultures, 10 percent shrub communities, 10 percent water and the rest is wet meadows and wetlands. This area is one of the most important in Bulgaria for the protection of river and riparian habitat. The flooded forests and floodplain supports rich flora and fauna, including rare species. The river has been altered by flood control structures, dams, a bridge, and quarrying.

Devetashko Plateau (Site BG0000615) covers an area of 14998.07 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. The site provides important habitat for mammals, reptiles and amphibians, fish, invertebrates, and birds. The site consists of 30 percent dry grasslands and steppes, 29 percent broadleaf deciduous forest, 21 percent other arable land, 17 percent shrub communities, and the rest is other land and cultivated trees. This site is a large karst plateau of high quality and relevance, containing a wide variety of surface and underground karst features. This area is one of the least disturbed in the central

Danube, which promotes healthy invertebrates. Recent intensification of grazing has threatened the site.

Vitata Stena (Site BG0000190) covers an area of 2630.19 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides important habitat for birds, mammals, reptiles and amphibians, and invertebrates. The area consists of 35 percent dry grasslands and steppes, 27 percent broadleaf deciduous forest, 16 percent shrub communities, 13 percent other arable land, and the rest is other land and mixed forest. This is an area of 60-80 meters of relief, containing both a rock massif and a karst lake. The rock provides suitable nesting habitat, and the lake provides important fish habitat. The area is vulnerable from forest clearing.

Tarnovski heights (Site BG0000213) covers an area of 4434.61 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides habitat for birds, mammals, reptiles and amphibians, fish, and invertebrates. The site is particularly important to invertebrates. The area consists of 36 percent shrub communities, 28 percent broadleaf deciduous forest, 15 percent mixed forest, 14 percent dry grasslands and steppes, and the rest is coniferous forests, other land, and other arable land. The location contains plantations of black pine. It is very urban, and the urban areas are expanding. Habitats are affected by this urban expansion, tourism, and military training exercises that take place in this area. The effect is that species composition is changes. Additional minor impacts arise from grazing.

Dryanovo Monastery (Site BG0000214) covers an area of 2987.89 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides habitat for mammals, fish, invertebrates, birds, reptiles and amphibians, many of which are protected. The area consists of 55 percent broadleaf deciduous forest, 15 percent mixed forest, 10 percent shrub communities, and the rest is bare rock, cultivated trees, coniferous forests, forest monocultures, and other land. This is a diverse karst landscape with caves, canyons, and springs, which are of key importance for the preservation of certain plant and animal species. The well-reserved deciduous forests are very important to supporting invertebrates. Human impacts have degraded habitats.

Emen (Site BG0000216) covers an area of 490.37 hectares and was designated a Natura site as a protected zone of the Habitats Directive. It provides important habitat for mammals, fish, invertebrates, plants, reptiles and amphibians, many of which are protected. The site consists of 49 percent broadleaf deciduous forest, 38 percent shrub communities, and the rest is dry grasslands and steppes, water, other arable land, and other land. This area includes a deep karstic canyon, water falls, caves, and forests. The area is vulnerable due to changes in the water regime, quarrying, and tourism.

Batin (Site BG0000232) covers an area of 2691.05 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. It provides important habitat for invertebrates, birds, mammals, reptiles and amphibians, and fish, many of which are protected. The site consists of 35 percent water, 30 percent dry grasslands and steppes, 19 percent broadleaf deciduous forest, 10 percent wetlands, and the rest is other arable land, sandy beaches, other land, and cereal crops. The site includes one of the largest islands of the Danube and former floodplain. Much of the floodplain was converted to a large fishpond, but was later abandoned and the water regime has returned to a more natural state. This area is very important for migration, nesting, and feeding waterfowl. The site is vulnerable to illegal hunting of endangered birds.

Skalsko (Site BG0000263) covers an area of 2189.47 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. Several identified habitats are important for supporting mammals, birds, reptiles and amphibians, invertebrates, and plants, many of which are

protected. The area includes 33 percent broadleaf deciduous forest, 26 percent shrub communities, 24 percent dry grasslands and steppes, and the rest is forest monocultures, other land, other arable land, wet meadows, rocks, water, and cultivated trees. The area of land under cultivation or abandoned from cultivation is not given. This limestone region supports a variety of tree species, with mature oak forests, hornbeam, beach, and others. Tree felling and replanting with different deciduous and coniferous species have changed the nature of the forest and has resulted in a change in habitat. Grassland habitats exist, and these areas do not seem to be impacted by haymaking. Most of the site is difficult to access, which makes it less vulnerable to human-induced changes. The part of the site adjacent to a vertical rock wall is subject to landslide.

Cave Swallow (Site BG0000269) covers an area of 1 hectare and was designated a Natura site as a protected zone of the Habitats Directive. It provides one important habitat (cave) that is important to the conservation of mammals and invertebrates. The site is 100 percent rock; no area of this site is under cultivation, although the entrance to the cave is in a vineyard. This underground and water habitat supports new crustacean species as well as relict species. The cave is an important winter refuge for bats. The cave includes several rooms and many cave formations. The cave is difficult to find and rarely visited, but shows some vandalism.

Stamboliyski Dam (Site BG0000275) covers an area of 9355.55 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone in the Birds Directive. It provides several important habitats that support mammals, fish, reptiles and amphibians, plants, birds, and invertebrates, many of which are protected. The site consists of 42 percent broadleaf deciduous forest, 24 percent shrub communities, 14 percent dry grasslands and steppes, and the rest is cultivated trees, other land, coniferous forests, other land, and rocks. The area includes a karstic area which has been flooded by the construction of the dam. Hills above the lake are forested.

Dryanovo River (Site BG0000282) covers an area of 183.16 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. It provides several important habitats that support mammals, reptiles and amphibians, fish, invertebrates, and birds, many of which are protected. The site consists of 34 percent other land, 32 percent shrub communities, 14 percent other arable land, 12 percent broadleaf deciduous forest, and the rest is mixed forest. The site is an important corridor. The site contains a stream and limestone and marl hills. Threats to the site include water pollution, clearing of coastal vegetation, disruption of access, diversion of water, and poaching.

Karlukovski Karst (Site BG0000332) covers an area of 14208.69 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. There are 128 identified species birds in this area, many of which are protected. The site consists of 24 percent grasslands and steppes, 22 percent broadleaf deciduous forest, 16 percent cereal crop, 13 percent shrub communities, 10 percent other arable land, and the rest is wet meadows, other land, coniferous forest, cultivated trees, and rocks. This site is a karst landscape with many rock formations, caverns, caves, and other karst features. Much of the area is occupied by grasslands, with some forested areas. The location is one of the most important areas in the country for conservation of several bird species, including globally threatened species. The site is threatened by grazing, fragmentation, pollution by domestic and industrial sources, use of the caves, rock climbing, use by tourists, and poaching.

Island (Site BG0000334) covers an area of 3439.55 hectares and was designated a Natura site as a protected zone of the Habitats Directive. Multiple identified protected habitats at this site support mammals, reptiles and amphibians, fish, and invertebrates, many of which are protected. The site consists of 33 percent cereal crops, 20 percent dry grasslands and steppes, 15 percent forest monocultures, 11 percent wetlands, and the rest is shrub communities, wet meadows, water, and broadleaf deciduous forest. This marshy area is a

former location of the Danube, and is one of the remaining bays that have not been fully drained. Many rare marsh plant species have survived. Channels between islands contain very slow running water, which provide habitat for aquatic communities. Opportunities exist to restore forest swamps and bays on the islands.

River Reserve (Site BG0000508) covers an area of 408.59 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. Several habitats have been identified at this location that support reptiles and amphibians, fish, invertebrates, and plants. The site is 35 percent cereal crops, 28 percent improved pasture, 18 percent grasslands and steppes, 12 percent broadleaf deciduous forest, and the rest is shrub communities and water. This is an important area for the conservation of salt meadows, and the area also contains flooding forest and steppe communities that support rare species. The forests have high conservation value, and the river is one of the few remaining habitats for a rare species. A picturesque windmill is on the site. The river has been affected by pollution and dissolved solids, and has been dammed. Hydropower, agricultural use, and forestry threaten the site.

Kozlodui Islands (Site BG0000533) covers an area of 605.76 hectares and was designated a Natura site as a protected zone of the Habitats Directive. This site contains several protected habitats that support mammals, reptiles and amphibians, fish, and invertebrates, many of which are protected. The site consists of 34 percent forest monoculture, 33 percent water, 12 percent shrub communities, and the rest is wetlands and other land. The site includes three major islands which are about 70 percent forested and also sand-covered and is an important site to the conservation of natural forests. The site is threatened by intrusion of introduced tree and shrub species.

Bozhkova Hole (Site BG0000605) covers an area of 1 hectares and was designated a Natura site as a protected zone of the Habitats Directive. This site contains a cave habitat important to the conservation of mammals. The site is 100 percent rock. This cave is one of the most significant caves for the protection of bats in the country. The cave is limestone and has a length of 326 m, consisting of several rooms.

Rositsa River (Site BG0000609) covers an area of 1440.86 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. This area contains several protected habitats that support mammals, reptiles and amphibians, fish, invertebrates, and birds. The site consists of 40 percent water, 15 percent dry grasslands and steppes, 15 percent shrub communities, 10 percent improved pasture, 10 percent broadleaf deciduous forest, and the rest is forest monocultures, coniferous forest, and rock. This area is a large river tributary with a flat valley. The site includes riparian forests and pastures within an agricultural landscape. The site is vulnerable to water pollution and poaching.

Yantra River (Site BG0000610) covers an area of 13900.41 hectares and was designated a Natura site as a protected zone of the Habitats Directive which is tangential to a protected zone of the Birds Directive. Many protected habitats have been identified at this site which protects mammals, reptiles and amphibians, fish, invertebrates, plants, and birds, many of which are protected. The site consists of 50 percent wet meadows, 15 percent water, 10 percent cultivated trees, and the rest is broadleaf deciduous forest, coniferous forest, mixed forest, other land, forest monocultures, and rock. The site is in a major river valley and contains the adjacent agricultural areas and wetlands. River banks are limestone, and the river bed has been adjusted. The site is vulnerable to quarrying and mineral extraction, tree felling, construction of flood protection projects, and pollution. This has resulted in habitat destruction and changes in river morphology.

River Ogosta (Site BG0000614) covers an area of 1253.24 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. Several protected habitats have been identified at this site which supports mammals, fish, invertebrates, reptiles and amphibians, and birds, many of which

are protected. The site includes 56 percent improved pasture, 20 percent cereal crops, and the rest is wetlands, water, broadleaf deciduous forests, and dry grasslands and steppes. At this site, a former river watercourse has become a lake. The site also contains forest, steppes, and wetlands. The area is rich in fish and has a diversity of flora and fauna. Accumulation of sediment and eutrophication are problems, which is a consequence of damming. The site is also threatened by water pollution, poaching, forest clearing, and changes in the water regime.

Micro (Site BG0000616) covers an area of 15447.16 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. Multiple protected habitats have been identified that support mammals, reptiles and amphibians, fish, and invertebrates, many of which are protected. The site consists of 55 percent broadleaf deciduous forest, 27 percent dry grasslands and steppes, 12 percent mixed forests, and the rest is shrub communities and other arable land. This site includes large forests and a karst landscape with caves, which support bats. The site is highly vulnerable to illegal logging.

Visible (Site BG0000618) covers an area of 1823.05 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. Several protected habitats have been identified that support mammals, reptiles and amphibians, fish, invertebrates, and plants, many of which are endangered and protected. The site includes 38 percent dry grasslands and steppes, 37 percent other arable land, 11 percent other land, and the rest is mixed forest and broadleaf deciduous forest. This is one of the most important habitats in Bulgaria for the protection of rare species. It is an important corridor for fish and contains a valuable riparian habitat. The area is threatened by the construction of hydropower sites that would change the natural water regime, as well as hunting.

Karlukovo (Site BG0001014) covers an area of 28841.93 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. Multiple protected habitats support mammals, fish, invertebrates, reptiles and amphibians, and plants. The site consists of 41 percent dry grasslands and steppes, 24 percent broadleaf deciduous forest, 19 percent shrub communities, 12 percent other arable land, and the rest is other land and cultivated trees. There contains a river course which has cut limestone gorges, creating rocky habitats of forests, meadows, and steppes. Rivers are preserved in their natural or semi-natural state in this area, and the riparian forest is one of the most significant in the country. The site is one of the most valuable for the conservation of fish, and it is an important fish migration corridor. Caves in the area support bats. The area is vulnerable to the possible construction of hydropower plants, which will impound 90 percent of the water. Other significant threats include forest clearing, alteration of the river bed, grazing, and collection of turtles for food and pets.

English Well (Site BG0001036) covers an area of 2618.99 hectares and was designated a Natura site as a protected zone of the Habitats Directive which overlaps a protected zone of the Birds Directive. This site contains several protected habitats important to mammals, reptiles and amphibians, fish, and invertebrates, many of which are also protected. The site contains a riparian ecosystem important as a corridor. The area is threatened by plans for constructing a new hydropower plant, which will alter the natural hydrological regime and have direct impact to fish. Plans for enlargement of the road may also threaten habitat through fragmentation. Grazing also presents a threat.

Golden (Site BG0002009) covers an area of 43494.44 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. The site includes 90 percent cereal crops, and the rest is dry grasslands and steppes, other land, broadleaf deciduous forest, and water. This location is an open grass plateau with small groves of trees. It is an important site to the protection of 122 bird species, of which many are protected and endangered. This is the only location in Bulgaria for one species. The site is affected by human activities related to agriculture, forest

management, and infrastructure development. Pesticide and fertilizer use as well as vegetation removal are the greatest threats to habitat and has led to reduction in some populations.

Vardim Island (Site BG0002018) covers an area of 1167.985 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. The site consists of 54 percent broadleaf deciduous forest, 41 percent water, and the rest is rock and other land. Seventy-five species of birds are known at this site, including many endangered and protected species. This is an important habitat for bird species dependent upon riparian forest bays. Most of the island is covered with a natural flooding forest. The location is sensitive to changes in the water regime and is dependent upon spring flooding. The site is vulnerable to the clearing of natural vegetation and introduction of other species.

Mechka Fish-ponds (Site BG0002024) covers an area of 2737.95 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. A large number of protected and other bird species occur at this site. The site consists of 45 percent water, 30 percent broadleaf deciduous forest, 10 percent dry grassland and steppes, and the rest is shrub communities, forest monocultures, other land, other arable land, and cereal crops. This is an important breeding, migration, and nesting site for 177 identified bird species, many of which are endangered. The site contains wetlands and small islands, and some wetland area has been converted into fishponds. Other site characteristics include marsh vegetation, reeds, grasses, shrubs, fruit trees, wet meadows, and slopes with mixed forest. The fishponds are dependent upon managing water levels and periods of drainage, and natural vegetation has been removed. Some wetland area has been converted to arable land. Continued fish farming will lead to habitat deterioration, and a project to increase Danube shipping capacity will lead to permanent deterioration of the wetlands.

Lomovete (Site BG0002025) covers an area of 3408 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. This is an important site for the conservation of many protected bird species as well as other species not under protection. The site consists of 68 percent broadleaf deciduous forests, 14 percent dry grasslands, and the rest is rock, shrub communities, water, wet meadows, forest monocultures, mixed forest, and other arable land. The site contains a set of deep canyons cut by river meanders, some of which have sheer limestone walls up to 100 meters high. Several major forest habitats exist here, and the valley contains wet meadow communities and grasslands. There are multiple protected plants, invertebrates, fish, reptiles and amphibians, mammals, and birds. The greatest threats come from haymaking before breeding season, tree felling, and tourist presence.

Apriltsi (Site BG0002110) covers an area of 1942.6 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. Several protected bird species are known here. The site consists of 34 percent wet meadows, 19 percent broadleaf deciduous forests, 17 percent dry grasslands and steppes, and the rest is mixed forests, coniferous forests, shrub communities, cultivated trees, other arable land, and other land. This is a site of international importance for conservation of globally threatened bird species that nest at this location in great numbers. The area is a complex of wet meadows and pastures on slightly sloping terrain around a river and its tributaries. The site is vulnerable to human activity associated with traditional uses of meadows and pastures. The most serious threat is mowing of meadows during breeding season. Conversion of grassland to arable land has destroyed some habitats, and changes to the hydrological regime will further affect the wet meadow habitat. Poaching is widespread and is causing a reduction in bird populations, including protected species.

Velchevo (Site BG0002111) covers an area of 2310.25 hectares and was designated a Natura site as a protected zone of the Birds Directive which overlaps a protected zone of the Habitats Directive. The site consists of 29 percent wet meadows, 24 percent mixed forests,

14 percent broadleaf deciduous forests, 10 percent dry grasslands and steppes, and a variety of shrub communities, cultivated trees, cereal crops, other land, and water. This is a site of international importance for the conservation of globally threatened nesting bird species. Alluvial wet meadow grasslands are located on both sides of the river. The area is vulnerable to impacts from human activities associated with traditional uses of meadows and pastures. The most serious threats are mowing during breeding season and conversion of meadow areas to arable land. Changes to the hydrological regime will lead to a change in the meadow habitat, and infrastructure development will lead to habitat fragmentation.

3.2 Potential impacts on Natura areas and mitigation measures

There could be two primary sources of impacts of the straw program on Natura areas: the harvest itself and the transport of straw from farms to straw storage areas.

3.2.1 Impacts from harvest

Some Natura areas include land that is used for agriculture, and lands that were but are no longer used for crops or grass. Some of the abandoned agricultural lands on Natura areas are reported to provide excellent habitat for bird species and possibly other flora or fauna. Natura areas known to include agricultural lands are identified in Table 3-29.[2]

Table 3-2. Natura 2000 areas that include lands used for agriculture

English name	*Code*	*Bulgarian Name*	*Agricultural Lands?*	*Area (ha)*	*Area type*	*Distance to nearest straw area*
Batin	BG0000232	Батин	x	2,691.1	Habitat	62.0
Karlukovski Karst	BG0000332	Карлуковски карст	x	14,208.7	Birds	66.0
Ostrov	BG0000334	Остров	x	3,439.6	Habitat	44.6
River` Reserve	BG0000508	Река Скът	x	408.6	Birds	67.6
Ostrovska step – Vadin	BG0000528	Островска степ - Вадин	x	301.3	Habitat	37.0
Golden	BG0002009	Златията	x	43,494.4	Birds	71.8
Belene Islands Complex	BG0002017	Комплекс беленски острови	x	6,897.0	Birds	18.4
Mechka Fish-ponds	BG0002024	Рибарници Мечка	x	2,738.0	Birds	58.0
Hadzi Dimitrovo Fish-ponds	BG0002070	Рибарници Хаджи Димитрово	x	446.5	Birds	41.4
Nikopol Plateau (bird)	BG0002074	Никополско плато	x	22,260.2	Birds	0.2
Svishtovsko-Belenska Lowland	BG0002083	Свищовско-Беленска низина	x	5,441.0	Birds	18.4
Upper Dubnik –	BG0002095	Горни Дъбник-	x	3,398.3	Birds	41.4

[2] The form completed by the Ministry of Environment and Water (or the Regional Inspectorate) to nominate sites for Natura 2000 includes an identification of current land uses. Although not complete, some forms state that land is currently used for agriculture.

Table 3-2. Natura 2000 areas that include lands used for agriculture						
English name	*Code*	*Bulgarian Name*	*Agricultural Lands?*	*Area (ha)*	*Area type*	*Distance to nearest straw area*
Telish		Телиш				
Obnova	BG0002096	Обнова	x	5,421.9	Birds	7.1
Devetashko Plateau	BG0002102	Деветашко плато	x	7,892.9	Birds	33.2

The most significant impact 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. In the forms that need to be submitted to nominate sites for Natura 2000, the Ministry of Environment and Water (or the Regional Inspectorates) identifies the greatest risks to the site. Agriculture and/or mowing is specifically named as a potential threat to the habitat or the flora/fauna or the following sites:

- Velchevo (Site BG0002111)
- Lomovete (Site BG0002025)
- Apriltsi (Site BG0002110)
- Golden (Site BG0002009)
- Ostrovska Step – Vadin (Site BG0000528)
- Black Hill (Site BG0000516)
- Cold River (Site BG0000233)
- Devetashko Plateau (Site BG0002102). It should be noted that this area also appears in Table 3-2 as supporting agriculture. It is over 30 kilometers from the nearest straw storage areas.

It is not known if Enemona will purchase straw from farmers or cooperatives that grow straw on any of these Natura areas. In some cases, farmers may wish to convert additional land to agriculture so they will have more straw to sell. If the lands are in Natura areas, it would reduce the value of the land as habitat for birds or other animals or plants. This could occur at nearly any of the areas, but would be most likely in the areas that contain land that is or has been used for growing crops or has been used in the past.

A number of operating procedures will be implemented to avoid, reduce, or mitigate for the potential for the potential impacts. These include:

- Keeping tractors and workers on cultivated land and away from land not being used for crops. This will prevent impacts on undisturbed land and habitat.
- Keeping tractors and equipment in good operating condition. This will reduce the potential for leaks.
- Refueling tractors and trucks only in areas away from water and away from undisturbed lands. This will reduce the potential for harmful spills.

Enemona will consult with the Regional Inspectorate of Environment and Water if it intends to purchase straw that is grown on any Natura area. In that case, Enemona and the Regional Inspectorate will reach agreement on any additional mitigation that may be needed, which could include limiting mowing to specific seasons, protection of other land that would provide equivalent habitat value, and other measures. When land is not currently used for crops or straw but is converted so the farmer can sell the straw,

Enemona will work with the Regional Inspectorate to determine the need to provide permanent protection to land of equivalent value as habitat.

3.2.2 Truck and tractor transport to straw storage areas and to CHPP

Roads cross many of the Natura areas, as shown on Figure 3-2. Table 3-1 shows some areas have over 100 kilometers of roads. When trucks travel along these roads, their noise could disturb birds or other fauna, and there could be spills or leaks in case of accidents within the areas. This would be most likely in Natura areas that are nearer straw storage areas and that have more roads.

Noise is not likely to be a significant problem since these are public roads that already support varying amounts of traffic. During harvest season, trucks and some tractors will be on the roads for 12 hours per day, which could increase the time and amount of traffic noise. It is unlikely even this will disturb critical fauna since they would be unlikely to be found near the road, especially during daylight hours. Keeping trucks and tractors in good operating condition will ensure that vehicles do not generate excessive noise.

A number of operating procedures will be implemented to reduce the potential for other impacts on Natura areas that are used for growing straw. These include:

- Keeping tractors and workers on cultivated land and away from land not being used for crops. This would prevent impacts on undisturbed land and habitat.
- Keeping tractors and equipment in good operating condition. This would reduce the potential for spills and leaks.
- Refueling tractors and trucks only in areas away from water and away from undisturbed lands. This would prevent impacts from spills on water and undisturbed land and habitat.

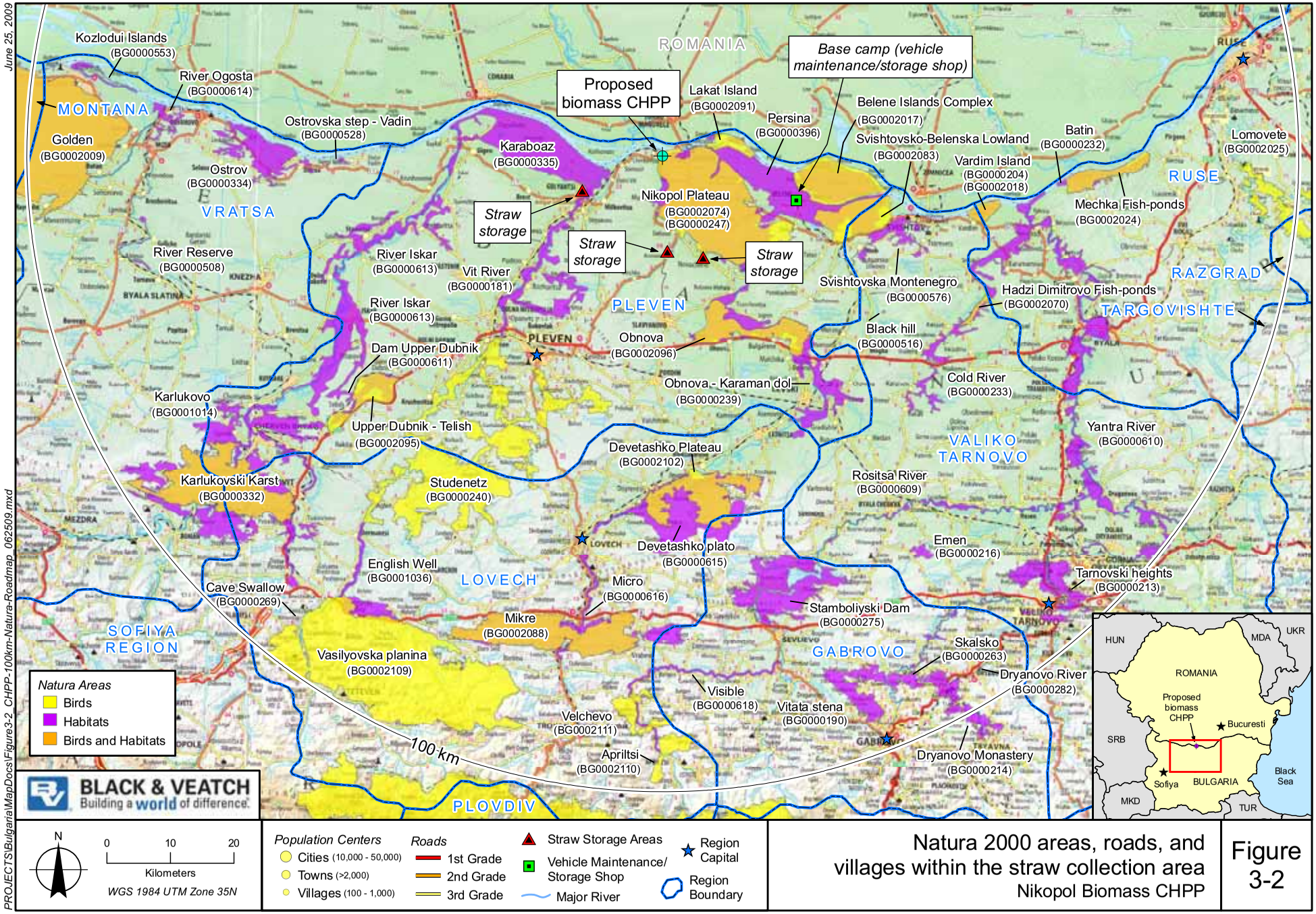
Beyond land used for agriculture, there could also be impacts from trucks that cross Natura areas while traveling between farms and straw storage areas, and between straw storage areas and the Nikopol CHPP. In general, the potential for accidents would be highest in Natura areas nearest the straw storage areas since there will be more traffic in these areas, and also in areas with the greatest lengths of roads. Table 3-1 shows the distance from each Natura area to the three storage areas, and the length of roads in those areas. Of the Natura areas along the Danube River[3], only Nikopol Plateau would experience a significant increase in traffic.

Even in nearby Natura areas with many kilometers of roads, the potential impact would be very small except in case of an accident, which could cause fuel spills. Even then, the impact would be very localized unless large amounts of fuel reached surface water. Over the 25-year life of the plant, there would be perhaps a few road accidents in Natura areas, but even then it is unlikely there would be a significant fuel spill. Operating procedures that will further reduce the potential for impacts include:

[3] From west to east, the Natura areas along the Danube River are Golden (BG0002009), Kozlodui Islands (BG0000553), River Ogosta (BG0000614), Ostrov (BG0000334), Ostrovska step – Vadin (BG0000528), Karaboaz (BG0000335), Vit River (BG0000181), Nikopol Plateau (BG0002074), Persina (BG0000396), Belene Islands Complex (BG0002017), Svishtovsko-Belenska Lowland (BG20002083), Vardim Island (BG0000204), Yantra River (BG0000610), Batin (BG0002032), and Mechka Fish-ponds (BG0002024).

- Hiring only drivers with good records and with appropriate licensing and training.
- Training drivers on the locations of Natura areas and cautioning them to take extra care in those areas. Drivers will be knowledgeable of Natura areas and the locations of roads that have curves, bridges, or narrow areas where they cross Natura areas.
- Maintaining spill cleanup kits in each truck and tractor.

In general, the potential for impacts to Natura areas from transport of straw is considered to be very low, but potential impacts could be serious under certain circumstances. Proper mitigation will reduce the likelihood even further, to the point where the risk is very minor.



Natura 2000 areas, roads, and villages within the straw collection area

Nikopol Biomass CHPP

Figure 3-2

4.0 CARBON BALANCE

Carbon dioxide and other greenhouse gasses are considered to be responsible for global warming. Under the Kyoto Protocol, Bulgaria and many other nations have agreed to control their carbon emissions. Among the many reasons for developing sources of renewable energy to reduce dependence on fossil fuels and by so doing to reduce carbon emissions. This section describes the total "carbon footprint" of the proposed CHPP Nikopol, including the power plant and the straw program, and compares it to the equivalent footprint of a plant that burned coal for fuel.

A project's 'carbon footprint' is the total amount of carbon dioxide (CO2) and other greenhouse gases that are emitted by a process or product, either the full life cycle or for a specific period of its life. A projects carbon footprint is generally expressed as grams of CO2 equivalent per kilowatt hour of generation (gCO2eq/kWh).

Emissions from trucks and tractors that move straw from fields to storage and from storage to the plant would be about 1,269,222 kilograms per year (Table 4-1). Burning straw at the plant would be carbon-neutral, since the carbon released during combustion each year would have been removed from the air as the straw grew during the growing season.

Carbon emissions from an equivalent 46.2MW plant that burned lignite coal would be over 443,117,166 kilograms per year[4], not including carbon emissions from mining and transportation. Thus, using biomass as fuel for the Nikopol CHPP would reduce carbon emissions by more than 440,000,000 kilograms per year compared to using lignite coal as fuel.

[4] Calculations are based on a 46.2MW plant with a heat rate of 12,000 BTU per kilowatt-hour burning lignite with carbon content of 27.2 kilograms per million BTUs for 8,000 hours per year.

Table 4-1. Carbon emissions from straw program
Proposed Nikopol Biomass CHPP

Truck Travel Emission Estimates

Basis:

Miscellaneous Information

Density of Fuel (Diesel)	0.839 kg/L		
Ultimate CO_2 Emission Factor for Diesel Combustion	3.14 * mass of diesel consumed	(Source Page 16 of the Emissions Inventory Guidebook, Dec 2006)	
Fuel Efficiency			
Farm Tractors (Agriculture)	2.125 km/L		
Board Trucks (Forestry)	3.188 km/L		
Road Trucks (Industry)	2.125 km/L		
Time	year		

Emission Factor Information

	NOx	NM-VOC	CH4	CO	NH3	N2O	PM	PM2.5	Cadmium	Copper	Chromium	Nickel	Selenium	Zinc
	(g/kg fuel)								(µg/kg fuel)					
Agriculture	50.3	7.27	0.17	16.0	0.007	1.29	3.93	3.70	0.01	1.7	0.05	0.07	0.01	1
Forestry	50.3	6.50	0.17	14.5	0.007	1.32	2.42	2.27	0.01	1.7	0.05	0.07	0.01	1
Industry	48.8	7.08	0.17	15.8	0.007	1.30	2.29	2.15	0.01	1.7	0.05	0.07	0.01	1
	(g/km of travel)								(g/km of travel)					
Agriculture	19.8	2.87	0.067	6.31	0.003	0.51	1.55	1.46	3.9E-09	6.7E-07	2.0E-08	2.8E-08	3.9E-09	3.9E-07
Forestry	13.2	1.71	0.045	3.81	0.002	0.35	0.64	0.60	2.6E-09	4.5E-07	1.3E-08	1.8E-08	2.6E-09	2.6E-07
Industry	19.3	2.79	0.067	6.23	0.003	0.51	0.90	0.85	3.9E-09	6.7E-07	2.0E-08	2.8E-08	3.9E-09	3.9E-07

** From "Emission Inventory Guidebook". December, 2006.

Calculations:

Operation	Days of Truck Operation (days)	Trips per days	Ave. Travel Distance (one-way) (VKT)	Total Travel Distance (round trip) (VKT)	Emissions (kg)													
					NOx	NM-VOC	CH4	CO	CO_2	NH3	N2O	PM	PM2.5	Cadmium	Copper	Chromium	Nickel	Selenium	Zinc
From Farming Fields to Storage Locations																			
Board Trucks (Forestry)	45	88	50	396,000	5,240	677	17.7	1,510	327,098	0.73	138	252	236	1.E-06	2.E-04	5.E-06	7.E-06	1.E-06	1.E-04
Road Trucks (Industry)	45	88	50	396,000	7,625	1,106	26.6	2,469	490,648	1.09	203	358	336	2.E-06	3.E-04	8.E-06	1.E-05	2.E-06	2.E-04
				Subtotal -->	12,865	1,783	44	3,979	817,746	2	341	610	572	3.E-06	4.E-04	1.E-05	2.E-05	3.E-06	3.E-04
From Storage Locations to Biomass CHPP (Board Trucks -Forestry)																			
Gulyantsi	365	7	20	102,200	1,352	175	5	390	84,418	0	35	65	61	3.E-07	5.E-05	1.E-06	2.E-06	3.E-07	3.E-05
Asenova	365	7	18.5	94,535	1,251	162	4	361	78,086	0	33	60	56	2.E-07	4.E-05	1.E-06	2.E-06	2.E-07	2.E-05
Novachene	365	7	21.5	109,865	1,454	188	5	419	90,749	0	38	70	66	3.E-07	5.E-05	1.E-06	2.E-06	3.E-07	3.E-05
				Subtotal -->	4,057	524	14	1,169	253,253	1	106	195	183	8.E-07	1.E-04	4.E-06	6.E-06	8.E-07	8.E-05
From Biomass CHPP to Vehicle Maintenance Area **																			
Board Trucks (Forestry)	60	1	35	4,200	83	12.0	0.28	26.5	3,469	0.012	2.14	6.5	6.1	1.66E-08	2.82E-06	8.29E-08	1.16E-07	1.66E-08	1.66E-06
Road Trucks (Industry)	60	1	35	4,200	56	7.2	0.19	16.0	5,204	0.008	1.46	2.7	2.5	1.10E-08	1.88E-06	5.52E-08	7.73E-08	1.10E-08	1.10E-06
				Subtotal -->	139	19	0	43	8,673	0.019	4	9	9	2.76E-08	4.70E-06	1.38E-07	1.93E-07	2.76E-08	2.76E-06
Total Emissions																			
					17,061	**2,327**	**58**	**5,191**	**1,079,672**	**2**	**451**	**814**	**764**	**3.E-06**	**6.E-04**	**2.E-05**	**2.E-05**	**3.E-06**	**3.E-04**

** Vehicle Maintenance assumes each truck (60 board trucks, 60 road trucks) will make one maintenance trip.

CO_2e (CO_2 + 21 x CH_4 + 310 x N_2O) 1,220,617 kg

Emissions as Carbon 294,456 kg

(based on amount of carbon in CO2 emissions alone). Carbon content in other pollutants such as VOCs, CH4 and CO not included since CO2 emission factor assumes all carbon in fuel is converted to CO2.

Tractor Travel Emission Estimates

Operation	Days of Truck Operation (days)	Hours of Truck Operation per day	Fuel Consumption (L/hr)	Total Fuel Consumed (L)	Emissions (kg)														
					NOx	NM-VOC	CH4	CO	CO_2	NH3	N2O	PM	PM2.5	Cadmium	Copper	Chromium	Nickel	Selenium	Zinc
From Farming Fields to Storage Locations (Farm Tractors - Agriculture)																			
Heavy Duty	45	24	11.4	12,267	517	75	2	165	32,303	0	13	40	38	1.E-07	2.E-05	5.E-07	7.E-07	1.E-07	1.E-05
Medium Duty	45	24	3.8	4,089	172	25	1	55	10,768	0	4	13	13	3.E-08	6.E-06	2.E-07	2.E-07	3.E-08	3.E-06

CO_2e (CO_2 + 21 x CH_4 + 310 x N_2O) 48,604 kg

Total CO_2e emissions 1,269,222 kg

Emissions as Carbon 11,746 kg

(based on amount of carbon in CO2 emissions alone). Carbon content in other pollutants such as VOCs, CH4 and CO not included since CO2 emission factor assumes all carbon in fuel is converted to CO2.

5.0 PUBLIC CONSULTATION AND DISCLOSURE PLAN

5.1 Introduction

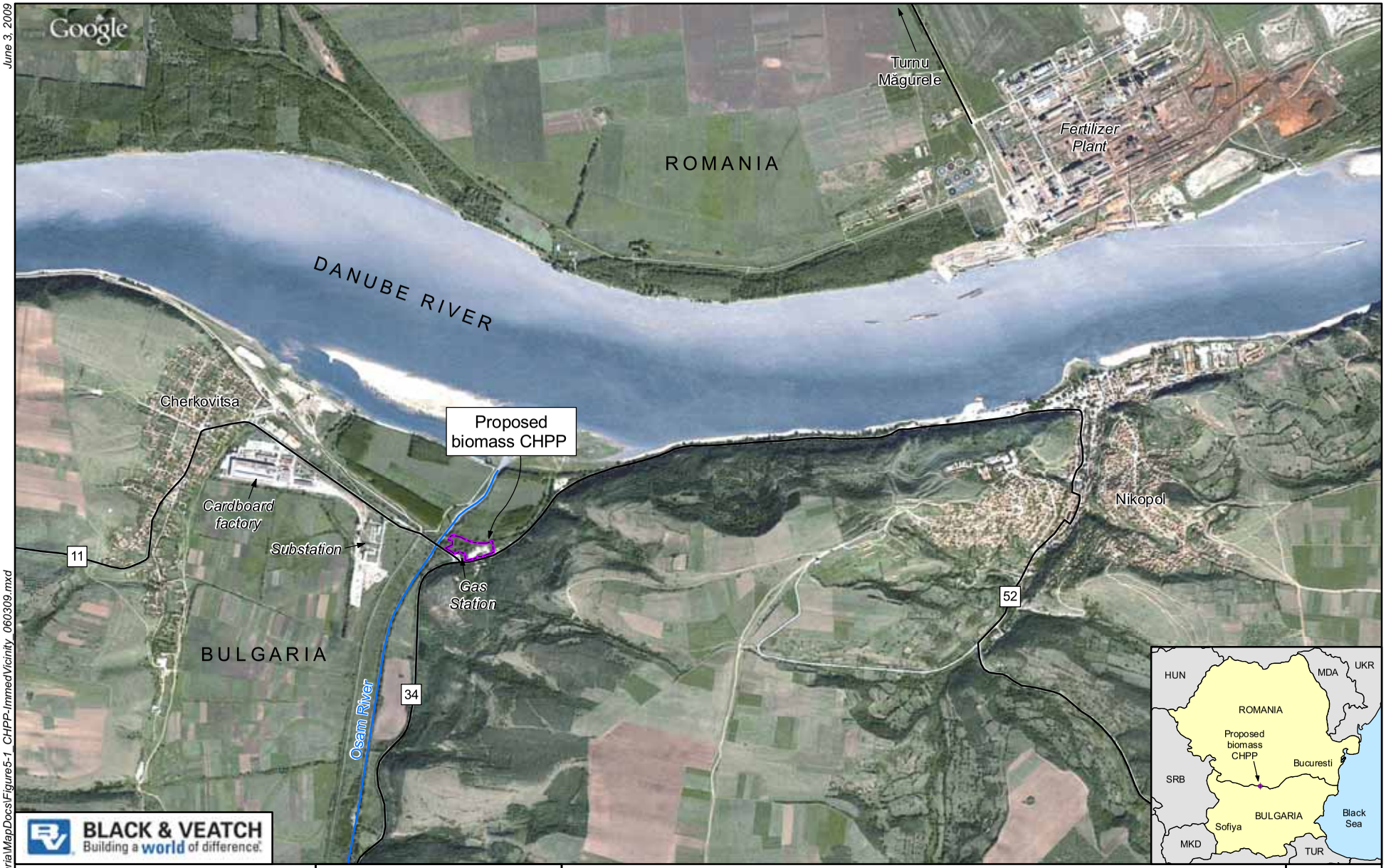
Enemona SA, a Bulgarian engineering and construction company, is planning to develop and construct a combined heat and power plant fired by agricultural biomass (straw) in the Nikopol municipality in North Bulgaria. The plant will be located adjacent to the Osam River near the village of Cherkovitsa. The plant will burn straw that is collected from agricultural lands within about 60 kilometers of the site and that has been stored in one of three storage areas. Figure 5-1 shows the location of the plant site. Enemona SA is seeking financing from the European Bank for Reconstruction and Development (EBRD).

The project requires an environmental impact assessment (EIA), prepared to meet Bulgarian requirements and best international practice, as defined by European Union standards and the European Bank for Reconstruction and Development (EBRD). A draft EIA intended to meet Bulgarian requirements was submitted to the Pleven Regional Inspectorate of Environment and Waters (RIEW Pleven) in March 2009, and a revised draft in April 2009 (Enemona's EIA experts are identified in Annex 3 of the EIA). Following the Regional Inspectorate's acceptance of the draft EIA and supporting materials in September 2009, two public meetings have been scheduled on 1 December, in Nikopol and in Cherkovitsa. The purpose of these meetings is to discuss the findings of the EIA and to hear comments and opinions from members of the public and other stakeholders.

The consulting firm Black & Veatch reviewed the EIA that was prepared under Bulgarian law to identify any gaps between this EIA and EU and EBRD requirements, and then to prepare supplementary information to cover any identified gaps; the supplementary information is found in this document, including sections 1 through 7. The review of the EIA determined that the stakeholder involvement mechanisms employed were not entirely consistent with international requirements. This Public Consultation and Disclosure Plan (PCDP) describes a program that meets EBRD requirements and can be implemented in conjunction with the public disclosure process for the EIA, or can be implemented separately.

The remainder of this section is organized as follows:

- Section 5.2 briefly describes applicable regulations and requirements for public consultation.
- Section 5.3 summarizes previous public consultation activities.
- Section 5.4 identifies project stakeholders.
- Section 5.5 describes the public consultation and disclosure program that will be needed for the supplementary materials.
- Section 5.6 provides the timetable for public disclosure.
- Section 5.7 describes resources and responsibilities.
- Section 5.8 describes a mechanism by which complaints and grievances may be communicated to Enemona.
- Section 5.9 describes monitoring and reporting.
- Section 5.10 describes management functions.



Proposed biomass CHPP and immediate vicinity

Nikopol, Bulgaria

Figure 5-1

June 3, 2009

PROJECTS\Bulgaria\MapDocs\Figure5-1_CHPP-ImmedVicinity_060309.mxd

5.2 Regulations and Requirements

5.2.1 Bulgarian Public Consultation Requirements

The Bulgarian Environmental Protection Act, Chapter One, Section III, on *Environmental Impact Assessment of Development Proposals,* has requirements similar to those of the EU EIA Directive. It calls for consultation with the public prior to initiation of the EIA as part of the scoping, for inputs from the public on assessment methodology to be employed, and for the EIA to take into consideration observations and opinions of the public concerned as well as authorities and other specialized institutions. Once the EIA is completed and published, public comments are accepted, and there must be a public discussion meeting after a 30-day review period. The RIEW Pleven then makes the decision and the decision will detail the manner in which the opinion of the general public will be taken into account, and how appeals to the decision are to be made. There is no clear detailing of a standardized grievance mechanism.

5.2.2 Public Consultation Requirements under the EU EIA Directive

The European Union's EIA Directive 85/337/EEC (as amended by 97/11/EC and 2003/35/EC) describes the impact assessment process that all EU member states must follow. The Directive was updated in 2003 to include the tenets for public participation that are incorporated in the *Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*. These changes were reflected throughout the EIA Directive in order to ensure there is significant public consultation throughout project development, impact assessment, and project implementation.

Article 6 provides that public participation for projects that may have environmental and/or social impacts should take place early in the decision making process. As the project develops, the public should be provided all relevant information, and alternatives should be clearly presented. All public comments must be taken into account and any rejection or disregard of those comments should be clearly justified. The public is then notified of decisions made and the reasons for the decisions.

Article 9 requires that members of the public have the right to challenge decisions or actions based on substantive or procedural legality. The public must be able to challenge decisions, acts, or omissions if the substance of the law has been violated (substantive legality) or if the public authority has violated procedures set out in law (procedural legality). Mixed questions, such as the failure to properly take comments into account, are also covered.

5.2.3 EBRD Public Consultation Requirements

The project must meet EBRD's 2003 *Environmental Policy* requirements, as this was the EBRD policy in force in early 2008 when the project was defined. The project, however, will also take into account the requirements in EBRD Performance Requirement 10 ("Information Disclosure and Stakeholder Engagement") of the 2008 *Environmental and Social Policy*. Although that policy is not directly applicable, it is best international practice.

The 2003 *Environmental Policy* for projects that require and environmental impact assessment obligates the project sponsor to provide the public, including NGOs, with information about the project during scoping stage and to prepare a Public Consultation and Disclosure Plan (PCDP). This PCDP meets that requirement, and outlines how disclosure and consultation will work throughout the EIA process and project implementation.

The PCDP will be one of several documents that are disclosed to the public. Materials to be disclosed also include EIA, additional information that supplements the evaluation of impacts

in the EIA, and a nontechnical summary of the entire disclosure. These materials will be placed on the websites of Enemona SA and the Regional Inspectorate (www.enemona.com and www.riew-pleven.eu) and the NonTechnical Summary will be placed on EBRD's website (www.ebrd.com). In addition, copies will be available for public review at Regional Inspectorate in Pleven, Enemona's offices in Sofia and Nikopol, and EBRD Offices in Sofia and London (see Sections 5 and 6 for details). Because this is a private sector project, public comments on the EIA will be received for 60 days prior to a decision being made on financing by EBRD (it should be noted this is longer than the minimum of 30 days required under Bulgarian law). All comments made during the comment period will be compiled and made available to EBRD prior to their decision on funding. A summary of the final decision and how the comments were taken into account will be made public.

The 2003 and 2008 EBRD policies require project sponsors to engage with stakeholders from the earliest stages of the project throughout the life of the project. Stakeholder engagement must be open, meaningful, and in an appropriate manner acceptable to the potentially affected communities. The engagement program must actively address the needs vulnerable populations who may be affected by the project. The EIA documents must remain in the public domain for the life of the project, and if changes to project plans are necessary, these have to be made public as well. The 2008 policy will be used as a guide.

As the project sponsor, Enemona SA will be responsible for communications and for addressing stakeholders' concerns in a timely manner. As described later in this PCDP, Enemona SA will establish a process to receive and facilitate resolution of stakeholders' concerns and grievances about the project's environmental and social performance. The grievance mechanism will be scaled to the risks and potential adverse impacts of the project.

5.3 Summary of Previous Public Consultation Activities

Public consultation has included meetings by Enemona staff and consultants with local municipal and regional government authorities, farmers' cooperatives responsible for producing straw, and owners of property directly contiguous to the site. Additional consultations with prospective buyer(s)/owner of a nearby cardboard recycling factory have also been held.

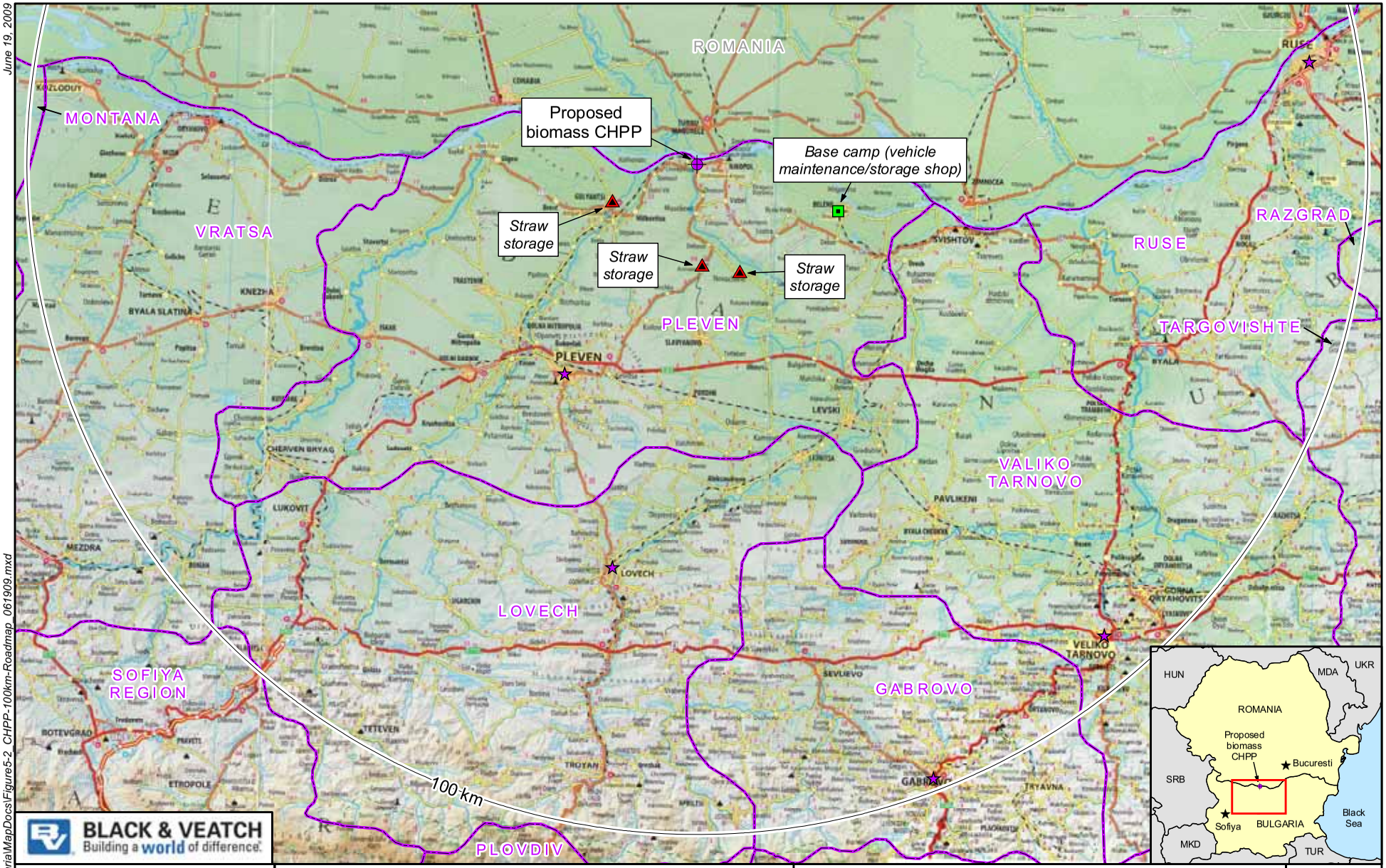
In addition, Black & Veatch met in February 2009 with local (Nikopol) and regional authorities (regional officials of the Ministry of Environment and Water and Ministry of Agriculture) and with a farmers' cooperative that will produce straw. In April 2009, Black & Veatch met with additional stakeholders, including the Chief of the local Firefighters Department, the Head of the Police Department responsible for traffic and transportation at Nikopol, the Mayor of Cherkovitsa, a Cherkovitsa resident, two local farmers, union representatives, and several NGOs whose focus is on nature protection.

5.4 Project Stakeholders

This chapter describes the various categories of stakeholders: communities, nongovernmental organizations, workers, national and regional governments, and municipal/local authorities. In general, stakeholders come from throughout the area from which straw will be collected, which is within approximately 100 kilometers of the plant, as shown on Figure 5-2. There are no known vulnerable groups who may be affected by plant operations.

5.4.1 Affected communities

Residential area of Cherkovitsa – the plant site is within the administrative boundaries of this village, which lies about 1.3 kilometers west of the plant site (Figure 5-1). This community has approximately 600 people, many of whom are (or were) employed at the former



Location of Nikopol Biomass CHPP, straw storage areas, and base camp within the straw collection area

Figure 5-2

cardboard manufacturing facility, which lies between the plant site and the village. Potential adverse impacts to residents of this village would include additional traffic-related impacts (noise, traffic safety, air pollution) from straw transport to the plant and air pollution from plant emissions. Positive impacts could include economic benefits from additional employment for village residents during construction and/or operation.

Residential area of Nikopol – the town of Nikopol lies about 2.3 kilometers east of the plant site and is the capital of Nikopol municipality. The town's population is just under 5,000 people. The main road to Nikopol borders the plant site, and could be locally congested near the plant site for short periods during construction. Nikopol could also experience very minor increases in traffic and air pollution from truck traffic between the base camp and the plant. Positive impacts would include additional employment and economic benefits.

Residential area of Belene – this town has a population of over 9,000 people and is the capital of Belene municipality. Vehicle maintenance facilities (known as the "base camp") will be located here. Potential impacts on residents could include congestion and noise during construction of shop facilities as well as noise and traffic during operation of the facility. Again, positive economic impacts would come from employment opportunities.

Farming and other communities – Enemona SA will purchase straw from local farms and cooperatives within about 100 kilometers of the plant site.[5] Although the traditional practice was to burn straw in the fields after harvest, this is no longer permitted by the authorities. Selling straw to Enemona SA will provide a new source of income to individual farmers and/or cooperatives. When straw is being collected in the crop harvest season, residents in agricultural areas and especially in villages and areas near the straw collection areas (see Figure 5-2) would experience increased truck and tractor traffic on the roads as well as by noise and dust (approximately 60 trucks per day to and from each straw storage area for the 45-day harvest season). Residents of villages between the straw storage areas and the plant site would experience increased truck traffic on a daily basis during plant operations as straw was transported to the plant (an estimated 6-8 trucks per day from each of the three areas). In addition, villages between Belene and Nikopol would experience increased traffic between the base camp and the plant.

This increased traffic would result in associated noise and air pollution as well as traffic safety issues. Table 5-1 shows villages within the straw collection area, the distance to the nearest straw storage area to the plant, and an overview of the increase in traffic that may be experienced.

Besides the increased traffic, it is important to note that the straw collection program will lead to additional employment and income in farming communities. Enemona SA will employ up to 90 persons during the approximately 45-day period when straw will be collected, most of whom will be residents of local villages. In addition, a number of truck drivers will gain permanent employment to transport straw to the plan every day, and there will be permanent workers to help load and unload the trucks.[6]

[5] At present, Enemona intends to purchase straw only from Bulgarian farmers, so this PCDP does not cover public consultation in Romania, nor does the EIA cover potential environmental and social impacts in that country. The purchase and transportation of Romanian straw would increase the transboundary implications of the project. Potential impacts that could result from developing a straw collection and transport program in Romania may trigger requirements under the Espoo Convention and may require a separate EIA.

[6] The number of truck drivers and workers is unknown at present but will be sufficient to load, drive, and unload at least 20 tractor-trailers of straw eacnh day (unloading may be fully automated, but that is not clear at present). Straw transport will occur 24 hours per day for seven days per week. Annual technical prevention of CHPP Nikopol will be during in the harvest season. The straw will be baled and transported to storage areas by trucks that we use to transport bales to the plant.

5.4.2 Nongovernmental organizations

The local, national, regional, and international NGOs who focus on environmental protection have an interest in this area because the planned CHPP will be located just at the edge of a protected eco-corridor along the Danube River. Interviews suggest that NGOs are favorably inclined toward this project if environmental protection measures are in place. As noted above, a representative of Nature Park Persina expressed concerns about potential impacts, and the EIA was revised to address at least some of those concerns. Indicative NGOs include the local Greenpeace chapter, the Foundation Environment and Agriculture, Bird Life (BSPB), World Wildlife Fund, Za Zemiata (For the Earth), Green Policy Institute, Demetra, Earth Forever, Open Society Club Russe, Institute for Ecological Modernization, and REC Central and Eastern Europe.

5.4.3 Hired firms and workers

The primary interest of contractors who prepare the site and construct the plant will be access to property around the site for construction, operation, and maintenance. They would also have in interest in maintaining positive community relations and minimizing delays and cost.

The interests of workers involved in CHPP construction, operation, and maintenance would include employment and income, occupational health and safety, housing during construction, and other concerns related to the work. The interests of temporary workers during straw harvest and collection season will be employment, income, and occupational health and safety.

5.4.4 Farmers

The suppliers of fuel for the CHPP will be farmers and farmers' cooperatives from the surrounding area. In the past, they burned the straw in the fields to clear it for the next season. Regulations no longer allow this practice, so an excess of straw now has to remain in the fields, be used for fodder, or be burned illegally. The primary interest of the farmers and the farmers' cooperatives is the ability to sell what is now a waste product for profit. In addition, if the Ministry of Agriculture in the future allows ash from the plant to be applied to the land, then the farmers may have a new source of some nutrients to use as fertilizer.

Farmers who are small land-holders and/or not under contract to Enemona SA may not enjoy the same benefits as those with contracts to sell straw. They may not produce enough straw to allow economic baling, and baling machines could be prohibitively expensive for them. Enemona SA has not yet made final plans on whether and how straw may be collected from small farms.

5.4.5 Regional and national government

Many ministries of the national government have interests in the project, including:

Ministry of Economy and Energy
Interests: successful implementation of project, increased use of Bulgaria's renewable resources, progress toward energy goals, increased sources for power in the country.

Ministry of Environment and Water
Interests: potential impacts on Osam River and the Danube, potential impacts from air pollution, potential disruption of natural processes, and potential impacts on sensitive and managed areas.

Ministry of Agriculture
Interests: providing cost-effective alternatives to seasonal straw burning, possible use of ash as fertilizer on agricultural lands, additional income for farmers and farming communities.

Ministry of Health
Interests: impacts on human health and social welfare

State Energy and Water Regulatory Commission
Interests: license for producing electricity and price for selling electricity. The licenses will serve as a pledge by the State toward the project, and will confirm (although not conclusively) the preferential purchase prices, needed by the CHPP Nikopol JSC to operate.

National Construction Control Directorate
Interests: Check the legality of issued permits and the compliance of construction activity within the scope of the respective permit. In case of violations, notify the Regional Directorate for National Construction Control to issue an order to cease construction works.

Authorities in Administrative Regions, Regional Governor of Pleven, Nikopol Municipality
Interests: reliable energy access for municipal sources and regional industries

5.4.6 Municipal authorities

Municipal authorities in Belene and Nikopol will be affected by increased traffic, increased employment opportunities for residents, increased markets for straw, increased fire prevention efforts, and increased air pollution. They also have an interest in the construction of the CHPP in order to increase local power generation; in the future, Nikopol may also benefit from hot water from the plant.

The municipal authorities in Gulvantsi, Asenova, Novachene, Cherkovitsa, and Nikopol will be impacted by the increase potential for fire, at the storage areas and at the plant site.

The communities that will be impacted by and involved in straw collection are shown in Table 5-1 and include the 150 or more towns, villages and municipal areas within about 100km of the CHPP on the Bulgarian side of the Danube River (see Figure 5-2 and Table 5-1). Consultation with local officials in the most affected areas (generally, those within 10-20km of the straw storage areas, those between the storage areas and the plant, and those between Belene and Nikopol) inform them of activities in their respective areas and to identify any sensitive populations along the transport routes (for example, schools at certain times of day, and seasonal variations).

Table 5-1. Communities within Straw Collection Area

Community	*Distance to plant (km)*	*Distance to nearest straw storage area (km)*	*Types of impacts to be expected*
Nikopol	7	24	Daily, continuous: traffic from Belene base camp to plant site, air pollution
Belene	41	58	Daily, continuous: noise, traffic from base camp construction and operation
Cherkovitsa	2	18	Daily, continuous: noise, traffic from straw storage area to plant site, air pollution

Table 5-1. Communities within Straw Collection Area			
Community	*Distance to plant (km)*	*Distance to nearest straw storage area (km)*	*Types of impacts to be expected*
Milkovitsa	13	5	Daily, continuous: noise, traffic from straw storage area to plant site Harvest season: truck and tractor traffic between farms and straw storage areas
Dolni Vit	9	5	
Somovit	6	12	
Debovo	17	3	
Muselievo	10	27	Daily: traffic between straw storage area to plant site Harvest season: truck and tractor traffic between farms and straw storage areas
Zhernov	9	26	
Luzitsa	25	42	
Lyubenovo	18	35	
Novachene	22	32	Daily: significantly increased traffic between straw storage area and plant (one truck per hour to the plant) Harvest season: significant increase in traffic between farms and nearby straw storage areas (one tractor or truck every four minutes at each area)
Asenovo	19	1	
Gulyantsi	5-25	<1	
Nearby villages (10-20km)	7	24	
All other villages within 100km (see Figure 5-2)	up to ≈160		Harvest season: increased traffic between farms and nearby straw storage areas. The farther from Novachene, Asenovo, and Gulyantsi, the less traffic there would be
Note: distances are approximate, as measured by road travel			

5.5 Public Consultation and Disclosure Program

The objective of this public consultation and disclosure plan (PCDP, also known as a stakeholder engagement plan, or SEP) is to map out the strategy for engaging the stakeholders in the EIA process and during project implementation. During the EIA process, all key information and findings, including this PCDP, the full EIA approved by the RIEW Pleven, EBRD's supplementary information, and a nontechnical summary of all these materials will be available through the EBRD and Enemona web sites. Announcements that the materials are available for public review will be sent to NGOs via the Blue Link information distribution service under the REC (Regional Environmental Center) in Sofia, and advertisements will be placed in local newspapers. Public meetings will be held in Nikopol and Cherkovitsa to receive comments from any stakeholder. Comments will be received for 60 days following public advertisement and disclosure. Copies of EIA materials will be available for public review at the following locations:

Nikopol Municipality 5 Alexander Stamboliyski Str. BUL-5940 Nikopol Pleven District Republic of Bulgaria	CHPP Nikopol JSC 2 Elia Str. BUL-5940 Nikopol Pleven District Republic of Bulgaria

Regional Inspectorate of Environment and Waters – Pleven 1A Alexander Stamboliyski Str. BUL-5800 Pleven Republic of Bulgaria	European Bank for Reconstruction and Development 17 Moskovska St. BUL-1000 Sofia Republic of Bulgaria

Electronic copies will be available at: www.enemona.com, www.ebrd.com, and http://riew-pleven.eu.

Materials will be made available for the duration of the project, including construction, operation, and maintenance. When important information is released, the public will be informed through media: Pleven regional newspaper "POSREDNIC", a district public radio station “Pleven,” and district cable television “Pleven Sprint.” In addition, information will be made available through direct contact on request.

Notice of availability and any changes to project plans will be made public through these venues, and through posting signs in directly impacted areas of the change in plans and location of public hearings, should these changes arise.

Prior to the public meetings, Enemona and/or the Regional Inspectorate will place advertisements in each of the media outlets identified above that announce the time and place of the meetings. Enemona SA will also directly notify local authorities of towns and villages near the plant and the straw storage areas.

5.5.1 Consultations with affected communities

Cherkovitsa – The mayor and village administration will be provided with a work schedule for project construction. If they request it, a schedule may be posted in a prominent place in the community. In addition, there will be a sign along the roadside at the plant and/or at the nearby gasoline station. The intention is so that people can be aware of when construction activities are taking place and the nature of these activities. If there are to be significant impacts, such as road blockages or other disturbances, this will be communicated as well. If there are major changes in the schedule, this will also be communicated. Officials will be given information on traffic to be expected through the village from transportation of straw from storage to the plant. The town administration will be requested to designate a person to be the custodian of project-related information and to be responsible for channeling questions and grievances to Enemona SA and/or appropriate authorities.

Nikopol – Town officials in Nikopol will also be provided with a work schedule for project construction. If there are major changes in the schedule, this will be communicated as well. Officials will also be given information on traffic to be expected throughout the municipality from transportation of straw to storage areas and then to the plant. During plant operation, town officials will be informed if there will be significant changes in traffic, noise or dust..

Belene - Town officials in Belene will be provided with a work schedule for construction of the base camp. If there are major changes in the schedule, this will be communicated as well. Officials will also be given information on traffic to be expected in and near the town and municipality from truck and tractor traffic. During base camp operation, town officials will be informed if there will be significant changes in traffic, noise or dust.

Farming communities – Officials in the communities between straw storage areas and the plant, between Belene and the plant, between Belene and the storage areas (if traffic is expected) will be provided information on anticipated traffic during harvest season and throughout the year. In addition, signs will be posted in communities between straw collection areas and the plant that notifies drivers and pedestrians of the anticipated truck traffic. During straw harvest season, signs will be posted on all roads in populated areas

within 20 kilometers of the straw storage areas notifying drivers and others who use the roads of the increase in traffic that can be expected over what period of time. In addition, signs will be posted on roads near the straw storage areas warning drivers of the extra traffic that can be expected.

5.5.2 Consultations with NGOs and civil society members

The NGO and environmental protection community will be able to monitor the construction and operation of the CHPP in accordance with Bulgarian and EU laws, and the Aarhus Convention. Key NGOs (see above) will be invited to review the EIA as early as possible by Enemona SA and through the REC Blue Link Information system. They will also be encouraged to attend the public hearing on the EIA. At present, it is expected there will be only one public meeting, and that it will be held in Nikopol. If it is determined that a second meeting is warranted to receive or address public comments on the EIA, it will be announced via media outlets and through municipal authorities and held in the Nikopol Municipal Building.

NGOs with direct concern with specific Natura areas will be notified of any operations in operations within a Natura 2000 site beyond those described in the EIA and supplementary information. Should any NGOs wish to provide independent monitoring of operations and impacts within their areas of concern, Enemona SA will work with them to place their findings on the Enemona SA web site (or the plant web site, if one is developed) and will incorporate appropriate findings into its own monitoring reports. Should there be any major changes to operations or if actual impacts are determined (as determined by NGO, Enemona SA, or authorities' monitoring) to be significantly different than predicted in the EIA, Enemona SA will consult with NGOs with expertise in the areas of concern to eliminate, reduce, or mitigation any such impacts.

5.5.3 Consultations with workers

The workers who will construct, operate, and maintain the CHPP are a special stakeholder group because they will be most directly involved in interactions with nearby residents and because their livelihoods will be dependent on the project. Similarly, temporary workers who are employed during straw collection will be directly affected.

Prior to beginning work in the field, the foreman of each field crew (during construction, and during straw collection) will receive a briefing on any relevant issues that were raised in the consultation process to ensure that they are aware of sensitivities that they may encounter. The foreman in turn will ensure that workers are aware of any social or environmental sensitivities within nearby communities. Workers will have a separate grievance mechanism from the public.

5.5.4 Consultations with farmers

Farmers may be divided into two groups: the members of larger cooperative farms who have already established straw sale terms, including harvest, collection and storage with Enemona SA , and the smallholder farmers who do not have formal agreements for sale of straw, nor the equipment for baling the straw. Both groups will play an important role in providing the CHPP with fuel, but their consultation methods throughout the life of the project will be different.

For the farmer's cooperatives, the arrangements for straw harvest, collection and storage are made under agreements between Enemona SA and the cooperatives. The cooperatives may purchase or lease baling machines and are likely to use member labor for the harvests.

As appropriate, smallholder farmers and smaller cooperatives will be notified with signs and public advertisements that describe whether (and if so, where, when, and for what price)

Enemona will be collecting straw from small farms and from cooperatives with whom there is no contract. This notice will be at least two weeks prior to collection, if any.

5.5.5 Consultations with national and regional government authorities

Enemona SA will consult with government authorities at all levels, including meeting legal reporting requirements under various permits and licenses, working with the relevant bodies to deal with unexpected impacts or issues, and working with authorities to help deal with grievances of other issues raised by stakeholders. After receiving an acceptable EIA and assessment of compatibility, RIEW Pleven determines which municipalities and/or mayors will participate in public debate, and there will now be meetings in Nikopol nad Cherkovitsa. Enemona SA will work with the RIEW Pleven for the EIA hearings, with the Ministry of Economy and Energy for implementation and funding, with the State Energy and Water Regulatory Commission for license for producing electricity and preferential price for selling electricity, with the Ministry of Agriculture to resolve issues related to the use of ash as a soil additive or fertilizer, and with the Directorate for National Construction Supervision for permission for construction and operation.

5.5.6 Consultations with municipal authorities

Municipal authorities will serve as a key link between the people and Enemona SA. They will help disseminate information to villages as needed. Enemona SA will work with municipal authorities (which are also among the affected communities, as described in section 5.1 above) to ensure that the timing of project activities is coordinated in advance of action, and the municipal authorities may be able to serve as liaisons with communities, the Ministry, regional authorities, and the contractors commissioned to construct, operate, and maintain the CHPP.

Prior to beginning straw collection and construction of facilities, officials of communities that will experience increased traffic (see section 4.6) will be notified by Enemona of the plans. They will be told of the increased traffic, precautions that will need to be taken, and impacts on roads and crossings.

Authorities in Gulvantsi, Asenovo, Novachene, Cherkovitsa and Nikopol will need to be consulted periodically regarding their fire prevention and emergency response capacities, and Enemona SA will need to ensure that on-site fire prevention measures are taken in accordance with municipal authority requirements.

Consultation with the officials in the communities within the straw collection area of the plant may be needed to inform them of project developments so they can alert local farmers as needed. For example, when Enemona SA is going to purchase and collect straw from small farmers and others with no contract, Enemona SA will need to notify the authorities in the area so they can notify farmers in turn.

5.6 Timetable

Table 5-2. Schedule for Nikopol CHPP EIA and Public Consultation

Activities	*Dates*	*Location*
Enemona SA scoping	2008	Nikopol, Pleven, Chernovitsa
Supplemental scoping	March-April 2009	Nikopol, Pleven, Chernovitsa, surrounding areas
Ministry of Environment and Water approval of EIA release	to be determined	Pleven
Draft EIA disclosure	24 September 2009	Pleven, Nikopol, internet listed

Table 5-2. Schedule for Nikopol CHPP EIA and Public Consultation		
Activities	*Dates*	*Location*
EBRD supplementary information disclosure, including action plans	14 October 2009	below
Public meeting 1: Nikopol	30 November (45 days after disclosure)	Nikopol Municipality 5 Alexander Stamboliyski Str. BUL-5940 Nikopol Pleven District Notification through media, web pages and municipal authorities
Public meeting 2: Cherkovitsa	1 December	to be determined
Closing of public comment period	7 days after public meeting	8 December 2009
Response to public comments and final EIA	14 days after meeting	15 December 2009
Notification of communities about construction schedule and harvest traffic	60 days prior to construction	Direct communication with communities or local authorities Local and regional press
Processing of grievances	Ongoing throughout project	Direct communications with person/organization filing grievance
Note: The supplementary information, including this PCDP, will be disclosed at approximately the same time as the Bulgarian EIA, and the public meeting will receive comments on the entire EIA package, including supplementary information. .		

5.7 Resources and Responsibilities

In coordination with the Pleven Regional Inspectorate of Environment and Waters, Enemona SA will hold a public discussion meeting for the EIA in Nikopol.

Enemona SA has designated Mr. Plamen Gechevsky as the Stakeholder Liaison and Environmental Officer. He will act as an assistant to Mr. Boris Petlov, the CHPP Project Manger. He will have the responsibility of continuing communications with the affected communities, NGOs, and other stakeholder groups.

Mr. Petlov and Mr. Gechevsky may be reached as follows:

Mr. Boris Petlov Executive Director, CHPP Nikopol 1408 Sofia, Ivan Vazov District 150 Vitosha Street, bldg. 70, vh A, floor 2, apt.3 Telephone: +359 2 8158514 Fax: +359 2 8158520 Mobile: +359 887 700 972 email: b.petlov@enemona.com	Mr. Plamen Gechevsky Stakeholder Liaison and Environmental Officer CHPP Nikopol JSC 5940 Nikopol, Pleven District 2 Elia Str. Telephone: +359 2 815 8519 Mobile: +359 885 262 284 e-mail: pl.gechevsky@enemona.com

5.8 Grievance Mechanism

A grievance can be defined as an actual or perceived problem that might give ground for complaint. As a general policy, Enemona SA will work proactively toward preventing grievances through the implementation of impact mitigation measures and community liaison activities that anticipate and address potential issues before they become grievances. This will be the responsibility of the Enemona Stakeholder Liaison and Environmental Officer.

5.8.1 Type of grievances

It is expected that there would be more potential for issues that lead to grievances in the construction phase of the project, with some potential during future operation and maintenance. Key grievances could include:

- Health and safety issues related to primary environmental impacts on nearby residents.
- Economic losses from loss of use of land or damage to agriculture or forest products.
- Social impacts due to construction crew activities or impacts on social infrastructure.

Anyone will be able to submit a grievance with Enemona SA if they believe a practice is having a detrimental impact on the community, the environment, or on their quality of life. Grievances could include:

- Negative impacts on a person or a community (e.g. financial loss, physical harm, nuisance).
- Dangers to health and safety or the environment.
- Failure of Enemona SA or its workers or drivers to comply with standards or legal obligations.
- Harassment of any nature.
- Criminal activity.
- Improper conduct or unethical behaviour.
- Financial malpractice or impropriety or fraud.

Attempts to conceal any of these.

Enemona SA will look into all grievances made by any person or organization. It may be found that a grievance is not connected to the project activity or that the project is being carried out in full compliance with applicable national and international standards. In these cases, the Enemona Stakeholder Liaison and Environmental Officer will explain this in writing to the person who filed the grievance. In all other cases, the Stakeholder Liaison and Environmental Officer will investigate whether there has been a failure to work to the intended standard, to identify ways to redress the grievance, and to identify measures to prevent the incident occurring again.

5.8.2 Submission of grievance

Grievances will go directly to Enemona SA. Receipt of the grievance by the company will be acknowledged in writing. Upon receipt, the grievance will be reviewed and responded to regardless of the outcome of the review (that is, whether redressed or not). The grievance mechanism will be made public throughout the public consultation process, and will be

maintained during the entire life of the plant. A sample grievance form is shown at the end of this section. It can serve as a template that can be used by a person wishing to report a grievance. This form does not have to be used, however; grievances may be in any format.

Grievances may be submitted to the Enemona project manager or to the Enemona Stakeholder Liaison and Environmental Officer:

Mr. Boris Petlov Executive Director, CHPP Nikopol 1408 Sofia, Ivan Vazov District 150 Vitosha Street, bldg. 70, vh A, floor 2, apt.3 Telephone: +359 2 8158514 Fax: +359 2 8158520 Mobile: +359 887 700 972 email: b.petlov@enemona.com	Mr. Plamen Gechevsky Stakeholder Liaison and Environmental Officer CHPP Nikopol JSC 5940 Nikopol, Pleven District 2 Elia Str. Telephone: +359 2 815 8519 Mobile: +359 885 262 284 e-mail: pl.gechevsky@enemona.com

Additionally, a receptionist who is trained to respond to grievances among other duties will staff the Enemona Nikopol office. In the event a grievance is made, the receptionist will alert the local Enemona staff and record the grievance for the Stakeholder Liaison and Environmental Officer. A log of all grievances will be maintained and summarized in the annual report on project performance, once names and specific addresses have been removed to protect confidentiality.

5.8.3 Grievance Resolution Process

In case the grievance is not related to project activity or in case Enemona SA finds that all work is consistent with applicable Bulgarian and international standards, the grievance will be further communicated to the appropriate authority (Ministry of Environment and Water, Ministry of Agriculture, Ministry of Transportation, firefighting authorities, etc.). When this occurs, the Enemona Stakeholder Liaison and Environmental Officer will explain it in writing to the person who submitted the grievance.

In all other cases, the Enemona Stakeholder Liaison and Environmental Officer in consultation with other authorities as needed, will investigate whether there has been a failure to work to standards and if so, to identify measures to prevent the incident from occurring again. In general, grievances will be resolved as described below.

Step 1: Receive Complaint
Once Enemona SA receives a completed form or is otherwise notified of a potential problem, they will assign someone to be responsible for resolving the grievance, including notifying other responsible authorities of the issue.

Step 2: Acknowledgement
The contact person will acknowledge receipt of a grievance by letter within 10 working days of having received the grievance. The acknowledgement will specify a Enemona SA contact person, their reference indicator, and an anticipated target date for resolution.

Step 3: Investigation
The Enemona SA contact person will work to understand the cause of every grievance. They may need to contact the claimant during this time. During this phase, Enemona SA will determine whether the grievance is related to the project, and if so whether the problem was caused by a failure to meet Bulgarian or international standards.

If the problem was indeed caused by a failure to meet standards, the Enemona Stakeholder Liaison and Environmental Officer SA will determine if this was a one-time occurrence or if there is an underlying problem with project activities. The responsible person will be

responsible for developing modifications to project activities as necessary to meet standards and avoid future problems, and for ensuring that project management and workers are properly counseled and trained to avoid future recurrences of the problem.

Step 4: Resolution
Once Enemona officials have investigated a grievance and determined the proper course of action, they will write to the claimant and disclose the results of the investigation and of the proposed course of action, if any. If the person who submitted the grievance considers the issue to be satisfactorily resolved, they will be asked to sign a Statement of Satisfaction. If the grievance remains unresolved it will be reassessed and there will be further dialogue with the claimant to determine if there are any further steps which may be taken.

Step 5: Follow Up
Enemona may contact the claimant at a later stage to ensure that the activities continue to pose no further problems. If there is a remaining problem, the issue will be treated as a new grievance and re-enter the process.

5.8.4 Confidentiality and Anonymity

A person submitting a grievance may wish to raise a concern in confidence. If the claimant asks Enemona SA to protect his or her identity, it will not be disclosed without consent. Details of submissions and allegations will remain secure within the team responsible for investigating the concerns. However, the situation may arise where it will not be possible to resolve the matter without revealing claimant's identity (for instance where it is required to give evidence in court). The investigative team will discuss with the claimant how best to proceed.

In case the claimant does not disclose his identity to the Ministry, it may make it more difficult to look into the matter, to protect claimant's position, or to give feedback. Accordingly, while Enemona SA will consider anonymous reports, such grievances are not encouraged. In order for any anonymous report to be taken seriously, the anonymous grievance will need to include sufficient facts and data to enable the investigative team to look into the matter without any further assistance.

5.9 Monitoring and Reporting

As needed, the Enemona project manager and/or Stakeholder Liaison and Environmental Officer will meet with communities and NGOs to discuss concerns and work to resolve them. Records of all consultations will be kept and made available to the stakeholders.

Enemona SA will publish the final EIA documents and provide a summary of issues raised during the consultation process and appropriate feedback on its website. Enemona SA also will place paper copies in Enemona SA and Ministry of Environment and Water regional offices, and in the EBRD Resident Office. Copies will also be distributed to regional Aarhus Centers.

Throughout the project, Enemona SA will maintain communication channels with relevant stakeholders as identified in this Plan, and Enemona SA will be responsible for ensuring that these channels of communication remain open.

In addition to the grievance procedure, Enemona SA will notify interested stakeholders of any significant project events, such as changes in the project schedule, major changes in project planning, or the scheduled straw collection season. Enemona SA will provide project updates on its web site and to the affected communities.

During construction and operation, Enemona SA will produce an annual environment and safety report, which will be based upon a summary of the project's performance on

management of health, safety, environment and social issues. They will also produce an annual Stakeholder Relations Report detailing consultation, meetings, notifications and grievances, as well as all grievance resolutions. A summary will be posted on the Enemona website and provided in Bulgarian to Aarhus centers and in local authorities' offices. The supplemental information disclosed during the EIA process will include annual submission of a monitoring report to EBRD and other lenders that covers key environmental, social, and occupational health and safety aspects of the project. In addition, it is noted that data from monitoring air and soil quality will be maintained in public registers that are accessible to the public.

5.10 Management Functions

Enemona SA has designated a Stakeholder Liaison and Environmental Officer. It is anticipated that this person will be a key member of the project development team and will provide an important integration function for the implementation of the project. The oversight of the project will be the responsibility of the Chairman of Enemona SA, and the Stakeholder Liaison and Enviornmental Officer will report directly to the Chairman. This liaison officer should have experience working with multiple stakeholder groups, training workers to the issues of specific cultures and sensitivities of the project, working with media outlets, stakeholder group mediation, and experience with relocation and compensation issues as needed.

The Stakeholder Liaison and Environmental Officer will be responsible for maintaining a stakeholder database, a comments register, and a list of project activities that could affect stakeholders. The Stakeholder Liaison and Environmental Officer will communicate directly and through the media to inform communities of work to be done in their area as far in advance as possible, which will be at least two weeks in advance of construction and maintenance wherever possible. The Stakeholder Liaison and Environmental Officer will also be responsible for ensuring foremen and workers are trained about issues and concerns and how these can be addressed throughout project implementation. The Stakeholder Liaison and Environmental Officer will visit work sites periodically to introduce communities to the foreman and to encourage a positive dialogue between communities and contractors.

Sample Grievances Form

Full Name

Address:

Telephone:

E-mail:

Description of Incident or Grievance:
(What happened? Where did it happen? Who did it affect? Who caused the problem? Who did it happen to? What is the result of the problem?)

Date of Incident or Grievance:

What would you propose to resolve this Grievance?

Signature: _____

Date: _____

Please return this form to:

Mr. Plamen Gechevsky
Stakeholder Liaison and Environmental Officer
CHPP Nikopol JSC
5940 Nikopol, Pleven District
2 Elia Str.

Telephone: +359 2 815 8519
Mobile: +359 885 262 284
e-mail: pl.gechevsky@enemona.com

6.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLANS

Construction, operation, and maintenance of CHPP Nikopol could have a moderate or major adverse impact on several environment and social resources. For that reason, precautions must be taken to ensure that major adverse effects are avoided, reduced, or otherwise mitigated.

The section presents an environmental and social management plan (section 6.1) and a monitoring plan (section 6.2). Collectively, these comprise the environmental and social management and monitoring plan (ESMMP). The ESMMP will be part of the loan agreement between Enemona SA and EBRD and will be the mechanism by which EBRD and other lenders ensure that the project meets Bulgarian and international standards.

6.1 Environmental and Social Management Plan

Table 6-1 is the environmental and social management plan for the Nikopol CHPP and its associated programs. Requirements are based on guidelines from the International Finance Corporation (2007 and 2008), EBRD (undated, 2003a, 2003b, and 2006), IPPC (2006), and the World Bank (2008). Enemona will need to oversee its subsidiaries and all contractors to ensure that the companies and their workers comply with the mitigation measures in the plan. The plan will need to be periodically updated as the project progresses through its different phases and experience is gained as to actual practices and their actual impacts.

The management plan identifies the specific environmental or social aspect of the project being addressed, the potential impacts of concern, the measures or actions that need to be taken to avoid or reduce the impacts, the basis of the requirement (national or local standard, EBRD or other international standard, best management practice, etc.), an indicator that can be used to monitor implementation, and the party responsible for the action.

6.2 Environmental and Social Monitoring Plan

Table 6-2 is the environmental and social monitoring program that will be implemented to verify the effectiveness of the environmental program in reducing impacts and also to allow mitigation measures to be refined or developed as needed to address actual impacts or to develop plans for future development.

More specifically, the objectives of the monitoring program are to:

- Measure and record project impacts during construction and operation.
- Evaluate the effectiveness of the mitigation measures and identify any shortcomings.
- Meet legal and community obligations.
- Allow refinement and enhancement of mitigation measures to further reduce impacts.
- Allow development of mitigation measures to deal with unforeseen issues or changes in operations.

Allow Enemona and international lenders to verify that requirements of loan agreements are being met.

Table 6-2 describes the media or variable of concern, the stage of the project, the specific parameters and activities to be monitored, the standards that apply to those parameters/activities, the location and frequency of monitoring, and reports and deliverables that must be prepared and submitted.

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP

No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
1.	**Project Design and Planning**					
1.1	Enhancing Environmental Management System	Current lack of environmental expertise and authority in the CHPP Nikopol JSC management structure	Designate an Environmental Officer to deal directly with environmental issues at plant and straw program. Would report to OSHE director and CHPP Nikopol Project Manager	Good International Industry Practice	CHPP Nikopol JSC EMS system in place Appointment of Environmental Officer	CHPP Nikopol JSC Project Manager and Enemona management
1.2	Company-community interaction	Concerns expressed by stakeholders about lack of up-to-date project information (status, progress)	• Implement PCDP, including communication program during construction and operation. • Regularly report on Company's achievements and publicize corporate responsibility, social accountability, and environmental protection activities to the public	• Good International Industry Practice • EU best practice • EBRD social engagement PR10	• Evidence of communication to all project stakeholders • Regular (twice a month) public reports on CHPP Nikopol JSC project progress • Annual report to lenders on consultations	Enemona SA/ CHPP Nikopol JSC and Stakeholder Liaison and Environmental Officer
		Apparent misperceptions by stakeholders about (a) hot water system and (b) employment opportunities	• Immediately disseminate accurate information on intentions regarding employment and hot water system			
1.3	Air quality planning	Current modeling is theoretical, not based on type of technology. Thus, cannot demonstrate	After selection of technology, conduct additional modeling runs using PLUME or alternative model to predict stack emissions and ambient	EU and Bulgarian standards	Predicted emissions and air quality compared to standards Report to	Enemona SA, CHPP Nikopol JSC, and Stakeholder Liaison and

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
		compliance with emissions or ambient air standards	air quality to verify compliance Modify technology as needed		lenders on modeling	Environmental Officer EPC contractor
1.4	Water quality planning	No current modeling of effluent quality or effect on surface waters. Thus, no demonstration that discharges will meet standards	• After selection of process and wastewater treatment technologies, conduct analyses to verify effluents will meet discharge standards, including temperature standards • Modify technology as needed	EU and Bulgarian standards	Predicted discharges and receiving water quality, compared to standards	• Enemona SA • CHPP Nikopol JSC, and new Stakeholder Liaison and Environmental Officer • EPC contractor
1.5	Traffic planning	• Risks to public from heavy traffic to occur on rural roads and through villages during construction and especially operation	• Develop traffic management plans for (a) construction phase (b) for straw collection, and (c) year-round transport to plant. Goal would be to maximize efficiency of transport and minimize risk in drivers and the public, especially in heavy pedestrian areas (schools, etc.). • Consult with and receive approval/agreement of traffic/roads authorities and local officials.	• Good International Industry Practice • EU best practices	• Traffic management plans • Approval by authorities • Report to lenders when approved	• Enemona SA • CHPP Nikopol JSC • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
		•	• As required by final plans, work with authorities to install appropriate traffic signs and signals at plant, straw areas, and base camp (and temporary signs near farms where straw is collected) • Consider hiring transportation manager/ expert			
1.6	Response planning	• Multi-faceted program is critical to project success (safety, cost, etc.)	• Design routine and emergency response plans to deal with traffic, safety, fire, and other incidents/contingencies. Separate plans for plant, straw areas, base camp, traffic (for traffic, see 1.5 above). • Consult local emergency response authorities, including fire response, medical response, and flood management, to reach agreement on response plans and ensure they are prepared to respond in an emergency • Provide financial or other support to local responders as needed	• Good International Industry Practice • EU best practices	Response plans Consultation records	• Enemona SA • CHPP Nikopol JSC • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
1.7	Waste management planning	• Need for comprehensive planning	• Develop waste management plan for construction and operation phases: construction debris, used oil, wood waste, ash, etc.	• Good International Industry Practice • EU best practices	Comprehensive plan	• Enemona SA • CHPP Nikopol JSC • EPC contractor
1.8	Safety planning	• Complex project will present safety risks to workers and public	• Develop occupational health and safety plan (noise, toxics, traffic, equipment operation, personal protective equipment etc.) for plant and straw collection and delivery programs • Develop public health and safety plan. Perhaps combine with traffic management plan.	• Good International Industry Practice • EU best practices	Comprehensive plans	• Enemona SA • CHPP Nikopol JSC • EPC contractor
2	**Construction**					
2.1	Air quality	• Fugitive dust at plant and straw areas • Combustion emissions from trucks and engine-driven construction equipment in all areas/facilities	• Receive all permits • Cover excavated topsoil/ subsoil stockpiles with plastic covers or plant grass seed on piles • Confine vehicles to demarcated roadways pathways/roads • Restrict unnecessary traffic, limit speed • Water spray roads in dry	• Good International Industry Practice • EU best practices • Bulgarian regulations	Compliance with air quality standards End-of-construction report to lenders	EPC contractor overseen by Stakeholder Liaison and Environmental Officer

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			periods • Supply workforce with dust masks • Maintain vehicles and equipment in good working order			
2.2	Water quality	Potential for erosion by stormwater, potential for spills/leaks	• See applicable items in 2.3 and 2.5	• See applicable items in 4.3 and 2.5	See applicable items in 2.3 and 2.5	EPC contractor overseen by Stakeholder Liaison and Environmental Officer
2.3	Waste management	Potential for waste mismanagement, soil/water contamination, violations	• Implement waste management and handling plan for construction phase (see item 1.7). Plan will call for the following, and more: • Apply for and receive all permits for waste management • 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	• Good International Industry Practice • EU best practices • Bulgarian standards	• Waste management records • Proper permits received • No violations • No spills • Maximum reduction and recycling • End-of-construction report to lenders	Enemona SA CHP Nikopol JSC EPC contractor overseen by Stakeholder Liaison and Environmental Officer

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			possible to keep dry. • Reduce amount of waste to maximum extent possible, recycle wastes where possible. • Collect solid, oily and chemical waste and store until transported to a designated waste disposal facility. • Collect sanitary waste in septics or use biotoilets on all sites • Provide adequate facilities for disposal of garbage (bins, litter trays, food waste) • Train workforce in waste management • Organize clean-ups of existing garbage/litter around construction sites • Store all waste away from surface water, ditches, other drainage ways			
2.4	Noise	Excessive noise on-site and/or off-site	• Notify nearby residents before and during construction • Confine construction	• Good International Industry Practice • EU best practices	• Off-site noise levels <70dB • Hearing protective	EPC contractor overseen by Stakeholder Liaison and Environmental

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			activities to daylight hours • Provide and require use of hearing protection to workers exposed to noise	• Bulgarian law	equipment purchases/supplies/records	Officer
2.5	Soil erosion/ contamination	• Accelerated erosion rates at construction sites • Soil contamination by spills of chemicals, fuel, oil	• Maintain records of materials handling and incidents and of construction activities • 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. • Store fuel, oil and chemical in designated secure areas. • Conduct refueling over impervious surfaces • Provide spill cleanup kits at all areas and in all vehicles	• Good International Industry Practice • EU best practices • Bulgarian standards	• Adequate records • Existence of soil stockpiles • Minimal soil erosion • No soil or water contamination • Prompt containment/ cleanup of spills/leaks • Inspection records • End-of-construction report to lenders	Enemona SA CHP Nikopol JSC EPC contractor overseen by Stakeholder Liaison and Environmental Officer

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			• 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 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. • Conduct refueling operations away from water			
2.6	Traffic	• Traffic congestion at entrance to plant site and/or straw storage areas • Potential collisions with other vehicles or pedestrians (death, injury,	• Implement traffic management plan (see item 1.5) • Consult with local authorities to improve signage, visibility and overall safety of roads near plant, straw areas, and	• Good International Industry Practice • EU best practices	• End-of-construction report to lenders • Number of consultations	EPC contractor overseen by Environment Officer

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
		property damage)	base camp. • 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.		• Number of signs • Purchase and deployment of traffic control devices • Agreements with emergency responders • Vehicle maintenance records • Training records • No traffic violations, no accidents	
2.7	Occupational and public health and safety	Worker injury or death Injury or death to non-worker	Implement worker and public health and safety plans for construction, including: • Provide safety training for all personnel, when initially hired and annually after • Monitor and warn for	• Good International Industry Practice • EU best practices	• Training records • Inspection records • Zero injuries and incidents during	• Enemona SA • CHPP Nikopol JSC • EPC contractor overseen by Stakeholder Liaison and

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			violations, take actions for repeated noncompliance • Provide and require use of appropriate personal protection equipment (do not allow workers to disregard) • Ensure at least one worker on each crew is trained in first aid and CPR • One person on each crew should be assigned as Safety Officer with authority to enforce health and safety program		construction • End-of-construction report to lenders	Environmental Officer
2.8	Employment/ Economics	Unrealistic expectations Fair wages	• To extent feasible, hire and train local workers for temporary and permanent positions. • Provide realistic information on employment opportunities, with transparent hiring practices. • Advertise when hiring • Pay at least national average wages for comparable positions	• Good International Industry Practice • EU best practices	• Number of local employees hired, as percentage of total workforce • Number of consultations with officials • Advertisements • Average wages (compared to local, regional, national averages) • End-of-employment	• EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP

No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
					report to lenders	
2.8	Public consultation	Need for public to be aware of project status	Continue to implement PCDP, including: • 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	• EBRD social engagement PR10 • EU best practice	• Records of announcements • Records of consultations • End-of-construction report to lenders	• Enemona SA • CHPP Nikopol JSC
3	**Operation**					
3.1	Air emissions and ambient air quality	CHPP combustion: • Particulates (TSP, PM10) • NO2 • SOx • etc.	• Apply Best Available Techniques to control stack emissions, including temperature control to minimize NO2 emissions • No need for SOx abatement (low sulphur content in straw) • Comply with air permit • Install Continuous Emission Monitoring System (CEMS) for stack emission measurements, or have monitoring be an integral	Good International Industry Practice EU best practices Bulgarian standards	• Annual report to lenders • BAT operating records • No violations of air permit or applicable standards • Installation of CEMS, and monitoring results	• Enemona SA • CHPP Nikopol JSC • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			part of SCADA. • Verify modeling results, calibrate model periodically to allow further refinement of operations and modeling.		• Model runs and results	
		Vehicle emissions (all areas/facilities)	Maintain fleet in good operating condition			
		Fugitive dust emissions (farms, straw areas, and plant)	• Use enclosed conveyor system • As needed, moisturize or otherwise suppress dust during ash collection and storage • Develop vegetation barriers around plant, base camp, straw areas to reduce off-site dust • Cover straw bales at all times while transporting straw. • Establish and enforce strict speed limits on unpaved tracks and roads. Penalize drivers for repeat violations. • Keep vehicles and equipment in good conditions • Confine vehicles to		• Vegetation planting records, vegetation health • Driver speed records • Vehicle maintenance records	

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP

No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			demarcated roadways.			
3.2	Surface water quality	• Contamination by process water discharges • Contamination by sanitary wastewater discharges	• Install and implement BAT to treat process and sanitary water • Comply with water permit(s) • Develop/implement monitoring program for effluent, for Osam River, and for cut-off meander near plant • Maintain stormwater collection/discharge system, if needed maintain settling basin(s)	Good International Industry Practice EU best practices Bulgarian standards and permit requirements	• Annual report to lenders • BAT • Compliance • Monitoring discharge and quality records (continuous compliance)	• Enemona SA • CHPP Nikopol JSC • EPC contractor
		Thermal pollution by cooling water discharges	• Monitor discharges and receiving water for temperature, install cooling technology if needed (multi-port diffusers, extended-length discharge channel, recirculating cooling water system, closed circuit dry cooling systems such as cooling towers, etc.).		Monitoring records of effluent and discharge (continuous compliance)	
		Stormwater management and contamination at plant site and base camp	• Control stormwater – prevent uncontrolled storm-water run-off that could cause erosion or carry oily wastes or other contaminants		• Records of control methods/ technologies	

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			• 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		• Consultation records, decision by authorities. • Maintenance records	
		Stormwater run-off at straw storage areas	• Prevent uncontrolled discharge of stormwater by use of berms, bales, etc. • Prevent erosion of sediment into surface waters		• Stormwater structures • Absence of erosion features	
3.3	Noise	Excess noise in work environments	• Measure noise levels on plant site and in plant. Take measures as needed to reduce noise to standards. • As needed, measure noise levels at farms, straw areas, and base camp. • As needed, implement noise control techniques (equipment selection, silencers for fans, acoustic machine enclosures; noise isolation, mufflers or silencers in intake/exhaust	• Good International Industry Practice • EU best practices • Local and national requirements and standards	• Monitoring records showing continuous compliance, corrective measures if needed	• CHPP Nikopol • EPC Contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			channels; using sound absorptive materials in walls and ceilings; vibration isolators and flexible connections minimize pressure variations in piping, etc). • Keep records of noise measurements • Provide and require use of hearing protection in noisy areas.			
		Off-site noise (and lights)	• Measure noise at property boundaries • Consult with nearest residents concerning noise (and lights) • Install berms and/or barriers (vegetative or other) between straw areas and houses and other receptors, also around base camp • At night, work at far end of straw areas • Maintain log of complaints		• Monitoring records • Consultation records • Berms/barriers • Work records • Grievance log	
3.4	Waste management	Soil and groundwater contamination from waste mismanagement	• Implement waste management plan (see item 1.7) for operations phase • Comply with all waste	• Good International Industry Practice • EU best practices	• Annual report to lenders • Compliance	• Enemoma • CHPP Nikopol • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			permits/regulations • Develop waste register for the power plant and vehicle repair/maintenance facility. • Identify waste reduction and recycling opportunities. • Segregate, store, transport, and dispose domestic, industrial and hazardous waste at nearest certified landfills/facilities. • Continue to work with Ministry of Agriculture on use of ash as soil amendment. • Inventory all chemicals, hazardous materials, fuel, including • Consult with local fire officials on emergency response procedures (see item 1.6) • BAT for fuel storage tank at base camp • Train all personnel who deal with hazardous materials • Provide spill cleanup materials (drum, absorbent materials) in all work areas	• Local national requirements and standards	with permit(s) • Waste register and records • Recycling/reuse records • Permission to use ash • Inventory • Consultation records • Training records • Presence of cleanup	

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP

No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			and all tractors and trucks, and train workers on use • Clean up all spills/leaks immediately		materials	
3.5	Health and safety	Worker injury or death	• Implement health and safety program that (see item 1.8) covers all jobs and activities, including: • Implement emergency response plan • Train all temporary and permanent employees and contract personnel in proper safety procedures • Include safety requirements in all contracts and subcontracts • Designate safety officer in every work crew at all locations, have at least one person trained in first aid on each site/crew • Monitor and enforce safety rules • Provide and require use of personal protective equipment • Consult with local health/emergency officials concerning emergency	• Good International Industry Practice • EU best practices • National and regional requirements and standards	• Annual report to lenders • Plan implementation records • Training records • Work records • Safety records • Consultation records • Incidence of accidents and violations	• Enemona • CHPP Nikopol • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			response			
		Risk to public health and safety	• Implement traffic plan and emergency response plan • Provide special driver training • Place traffic signs and signals near plant, base camp, and storage camp (during harvest) • Use flagmen and other signals at storage areas during harvest • Consult with local authorities and traffic officials near straw areas and other areas, before harvest begins on nearby farms • Require drivers to keep detailed records of routes, speeds, incidents		• Training records • Detailed driver records • Incident and/or complaint rate	
3.6	Natura areas	Damage to habitat or organisms	• Consult with NGOs who monitor Natura areas to develop avoidance and mitigation • For farms in Natura areas, train drivers and workers to stay on agricultural fields • Minimize traffic on roads through Natura areas, train	• Good International Industry Practice • EU Directives • Bulgarian law	• NGO consultation records • Training records • Straw contract provisions for reporting land conversion for	• Enemona • CHPP Nikopol • EPC contractor

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			drivers to avoid stopping • If new contracts will result in conversion of uncultivated lands to crops or straw-growing, consult with RIEW concerning possible mitigation or further study (for example, prepare a compatibility report, protect other lands) • Consider contributions to Natura area operating budgets • Comply with RIEW requirements that arise from Compatibility Reports		straw-growing • Record of RIEW consultation records in case of land conversion • Compliance with RIEW requirements	
3.7	Employment	• Fair labor practices • Unrealistic expectations	• To extent feasible, hire and train local workers for temporary and permanent positions. • Provide public with realistic information on employment opportunities, with transparent hiring practices. • Advertise for all positions • Pay at least national average wages for comparable positions	• Good International Industry Practice • EU best practices	• Employment records • Position descriptions • Payroll data	• Enemona • CHPP Nikopol • EPC contractor
3.8	Public consultation	• Need to inform stakeholders	• Continue to implement PCDP, including:	• EBRD social engagement PR10	• Consultation records	• Enemona SA • Nikopol CHPP

Table 6-1. Environmental and Social Management Plan for the Nikopol biomass CHPP						
No.	*Issue or Aspect*	*Gaps or potential impacts/concerns*	*Mitigation/Enhancement measures or Best management practices*	*Legislative requirements/best practice*	*Verifiable Indicator*	*Responsibility*
			• Consultation with officials in villages before harvest begins on nearby farms • Consultations with villages near straw storage areas before harvest season • Periodic publicity about project's record – safety record, environmental compliance record, economic contribution, employment, etc.	• Good International Industry Practice • EU best practices	• Public notices, advertisements, signboards, etc.	JSC • EPC contractor

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP

Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
Air quality	Construction	Fugitive dust (TSP, PM10)	WHO Ambient Air quality standards	At CHPP site At straw storage areas At base camp	Daily observation in dry weather	• Maintain records for each construction season, make available for inspection. • End-of-construction report to lenders
	Plant Operation	Ambient Air quality: 24-hour ground level concentration of PM10 and TSP. 1-hour average of NO2 and SO2 wind speed velocity and direction	EU Directive 1999/30/EC WHO Air Quality Guidelines, 2005	At the power plant: One monitoring point upwind Two monitoring points downwind At the base camp: Two monitoring points around the perimeter of the facility	Once every 6 months at plant; continuous sampling for 3 days	Annual summary report to lenders
		Stack emissions: • Emissions of PM • Emissions of NOx • Emissions of SO2	EU Directive 2001/80EC, for new biomass power plants	At stack, Continuous Emissions Monitoring System (CEMS)	• Stack Emission Testing – annual • Emissions Monitoring – continuous	Annual summary report to lenders on stack emission testing and emission monitoring
		TSP Visible dust	WHO Ambient Air quality standards Bulgarian standards	Farms, plant, and straw areas	Daily observations during dry weather operations	Maintain records of observations for inspection on demand
Water quality	Construction and operation	Stormwater Visible sheen on surface Eroded solids		Farms, plant, and straw areas	Weekly observation	Maintain records of observations for inspection on demand

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
		Evidence of erosion Run-off and erosion controls				
	Operation	Sanitary wastewater: Effluent flow rate pH, ToC, total dissolved solids (TDS), total suspended solids (TSS), BOD, COD, total nitrogen, total phosphorus, oil and grease, e-coli	EU Directive 98/15/EC guideline value EU/IFC guidelines	At the wastewater treatment facility outlet at the CHPP Nikopol power plant site Before draining into the central wastewater management system at the vehicle repair/maintenance facility At the wastewater treatment facility outlet at the CHPP Nikopol power plant site	Every 3 months	Annual summary report to lenders
		Industrial wastewater: Effluent flow rate pH, total dissolved solids (TDS), oil and grease, chromium, copper, zinc, iron and total residual chlorine. Temperature increase by thermal discharge from cooling system				
Ambient noise levels	Construction	Hourly equivalent sound pressure levels LAeq (dBA)	IFC Standards and WHO Guidelines for Noise and Best practices	At each construction site	One 24 or 48 hourly day and night sample. Once every two months	End-of-construction report to lenders
	Operation	Hourly equivalent sound pressure levels LAeq (dBA)	IFC Standards and WHO Guidelines for Noise and Best practices	In two locations – one east, and one west from the power plant site At nearest	Continuous 3 days 24 or 48 hourly daily measurements. Once every 6 months	Annual summary report to lenders

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
				residences to straw areas and base camp	After complaint, hourly measurements for one week	
Waste Management	Construction	Quantity and type of waste generated	IFC Standards and Best practices	At generation sources in construction areas	Daily observation, weekly records	End-of-construction report to lenders
	Operation	Quantity and type of waste generated	IFC Standards and Best practices	At generation sources and management areas	As reuired by waste management plan: at least daily records for hazardous waste, weekly for inert waste	• Annual summary report to lenders • As required by permit
Occupational and Public Health & Safety	Construction	Workplace inspections for noise, fire safety, hazardous materials registrar, solid and sanitary waste registrar Traffic safety: signs, road inspections Personnel health & safety training. Public notification about construction schedule and progress Driver training Public training for	IFC Standards and Best practices National standards	At each construction site	Workplace inspections - once per month Medical inspections before and after construction season Training: at hiring, before work	Designated by CHPP Nikopol JSC and Construction contractor. Work force manager (WFM) conducts OHS monitoring. Monthly paper reports to project manager with number of completed inspections as a key performance indicator Record of signs/warnings/consulations to lenders annually End-of-construction report to lenders

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
		traffic safety and avoidance of accidents Registrar of accidents Routine annual medical check-up for all workers • Personal protective equipment (hearing, sight, hands, feet, etc.)				
	Operation	Regular workplace inspections for noise, fire safety, hazardous materials registrar, solid and sanitary waste registrar Workers' medical monitoring Noise measurements (Leq 12 hours) Measurements of thermal radiation Traffic safety: signs, road inspections Personnel health &	IFC Standards and Best practices	At each project facility and at selected farms Annually At each project facility	Workplace inspections - once per month except one farm and storage area per week during harvest Medical inspections – annual Four times per year Once per year Public notice when harvest is in the area	Annual summary report to lenders

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
		safety training. Public notification about construction schedule and progress Driver training Public training for traffic safety and avoidance of accidents Registrar of accidents Routine annual medical check-up for all workers • Personal protective equipment (hearing, sight, hands, feet, etc.)			Immediately after the incidents Annual medical examination for workers Training at hiring, before work	
Socio-economic conditions	Pre-construction	Local population size Average hourly wage rate Local unemployment rate Proportion of local workers	Best practices	Town of Nikopol and Cherkovitsa as available	Once	Baseline socioeconomic conditions summary report as part of end-of-construciton report to lenders

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
	Construction	Wages of hired local residents and average national wage for comparable job Community relations: record complaints received from the communities, measures to address the complaints and results	Best practices	All facilities	Once per construction season	End-of-construction report to lenders
	Operation	Wages of CHPP employees and national wages for comparable job Contract values and royalties of full time CHPP employees Local population size dynamics for Nikopol and Chrekovitsa Average hourly wage rate in Nikopol and Chrekovitsa Local unemployment rate dynamics throughout Pleven Nikopol and	Best practices	CHPP site, Towns of Nikopol and Chrekovitsa town of Nalaikh, Pleven district, villages near straw areas	Once a year	Annual summary report to lenders

Table 6-2. Environmental and Social Monitoring Plan for Nikopol Biomass CHPP						
Media	*Project phase*	*Parameters*	*Standard*	*Location*	*Frequency*	*Deliverables*
		Chrekovitsa annual budget dynamics Community relations: record complaints received from the communities, measures to address the complaints and results				

7.0 REFERENCES CITED

CHPP Nikopol. Undated. Straw Availability and Supply. 7pp.

CHPP Nikopol. 2009a. Environmental Impact assessment Report [for] CHPP NIKOPOL. Combined heat power plant with total installed capacity 46 MW – Energy utilization of agricultural biomass in North Bulgaria. Prepared by Hitproekt Pleven EOOD for Enemona SA.

CHPP Nikopol. 2009b. Report on the Appraisal of Compatibility of an Investment Proposal. Prepared by L. Profirov and I. Raychev for Enemona SA.

CHPP Nikopol JSC. 2008 (May). Project Description.

Enemona SA. Undated. Straw Collection. 20pp.

European Bank for Reconstruction and Development (EBRD). 2008 (May). EBRD Environmental and Social Policy. Available at http://www.ebrd.com/about/policies/enviro/policy/2008policy.pdf. (URL active as of 1 April 2009)

European Bank for Reconstruction and Development (EBRD). 2008a (September). Public Information Policy. Available at http://www.ebrd.com/about/policies/pip/pip.pdf. (URL active as of 29 April 2009)

European Environment Agency, NECE/EMEP Task Force on Emissions Inventories and Projections. 2007. *EMEP/CORINAIR Emission Inventory Guidebook - 2007*.

European Bank for Reconstruction and Development (EBRD). 2006 (July 11). Energy Operations Policy (Renewable Energy). Available at: http://www.ebrd.com/about/policies/sector/energy.htm (URL active as of 15 May 2009).

European Bank for Reconstruction and Development (EBRD). 2003a (May). Environmental, Health & Safety Audit Protocol.

European Bank for Reconstruction and Development (EBRD). 2003b (July). Environmental Policy. Available at http://www.ebrd.com/about/policies/enviro/policy/index.htm.. (URL active as of 1 April 2009)

European Bank for Reconstruction and Development (EBRD). Undated. Sub-Sectoral Environmental Guidelines: " Available at http://www.ebrd.com/about/policies/enviro/sectoral/const.pdf (URL active as of 15 May 2009)

Integrated Pollution Prevention and Control Bureau (IPPC). 2006 (July). IPPC Reference Document on BAT for Large Combustion Plants, EU BREF under Article 16(2) of Council Directive 96/61/EC (IPPC Directive). Available at: http://eippcb.jrc.es/reference/lcp.html (URL active as of 1 June 2009).

International Finance Corporation (IFC). 2007 (April 30). Environmental, Health & Safety General Guidelines, including wastewater and ambient water quality, waste management and hazardous materials management, noise management, occupational health and safety, and construction and decommissioning guidelines.

International Finance Corporation (IFC). 2008 (December 18). Environmental, Health & Safety Guidelines for Thermal Power plants.

World Bank. 2008 (July). Industry Sector Guidelines. “Thermal Power: Rehabilitation of Existing plants and Guidelines for New plants.”