STATE JOINT STOCK COMPANY "UZBEKENERGO"

TALIMARJAN TRANSMISSION PROJECT

DRAFT OF SUPPLEMENTAL ENVIRONMENT IMPACT ASSESSMENT (EIA) REPORT

Prepared for:

Talimarjan PMU

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ABBREVIATIONS

ADB	Asian Development Bank
BGL	below ground level
CCGT	combined cycle gas turbine
CEAP	construction environmental action plan
CIS	Commonwealth of Independent States
CNR	construction rules and norms
DDP	distillation and deionization plants
DSC	design and supervision consultants
EA	executing agency
EIA	environmental impact assessment
EMP	environmental management plan
EMT	environmental monitoring team
EPC	engineering, procurement, and construction
IWIT	Industrial water integrated treatment
GLC	ground level concentration
KMC	Karshi Main Canal
MPC	maximum permissible concentration
NGO	nongovernment organization
NO_x	nitrogen oxides
OSG	Open Switch Gear
PCs	Public Consultations
PFS	preliminary feasibility study
PPS	Plant power station
PS	Polluting substance
PMU	Project Management Unit
PIU	Project Implementation Unit
SCNP	State Committee for Nature Protection
SNR	Sanitary norms and rules
SS	Substation
TPP	Talimarjan Power Plant
WB	World Bank
WWTP	Waste water treatment plant

WEIGHTS AND MEASURES

GWh	gigawatt hour
kV	Kilovolts
kWh	kilowatt hour
MW	Megawatt
t/h	tons per hour

NOTE

In this report, “$” refers to US dollars.

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1. EXECUTIVE SUMMARY

Introduction

Due to the growth of demand for power in Uzbekistan, the problem of aging infrastructure and the limited number of transmissions lines—1,850 km of 500kV lines, 6,200 km of 220kV lines, and 15,300 km of 110kV lines—some provinces experience frequent overloading, power losses. Such bottlenecks are becoming a serious problem.

Furthermore, the south receives power from the northeast, where 70% of electricity is generated, while more than 90% of natural gas is produced in the southwest; this means that natural gas is transported to the northeast to produce electricity and then sent back to customers in the south and southwest. The problem of transporting energy in this manner is being addressed in a Government plan which will involve using local natural gas to produce power for local use, thus eliminating the need to transport it and the losses that result from this inefficient process.

To this end, the plan involves constructing two combined-cycle gas turbine (CCGT) units adjacent to the existing Talimarjan Thermal Power Plant (TPP) and one CCGT unit in Navoi Province. These new units are to be located in the south of the country to make use of the local natural gas resources.

Also, the preliminary feasibility study conducted in 2007 by Uzbekenergo, the state electricity utility in Uzbekistan, found it was necessary to expand the transmission grid with a new 500 kV transmission line between Talimarjan TPP and Sogdiana substation to meet the growing power needs in the southwest.

To support the plans of Uzbekenergo, the World Bank is proposing to finance Uzbekenergo's project proposal consisting of a new substation—a 500 kV open switchgear (OSG)—at the existing Talimarjan TPP and a 500kV transmission line from there to the existing Sogdiana substation (218 km) that will pass through the provinces of Kashkadarya (131 km) and Samarkand (87 km). The substation will be constructed adjacent to the Talimarjan TPP on land that will be transferred from the local administration to Talimarjan TPP.

The main reason to construct the high voltage 500 kV line to the Sogdiana substation with OSG 500 kV is to make the electric power system more stable, eliminate the restrictions in power supply to the Samarkand-Bukhara energy hub, supply electricity to the new consumers in the southwest, reduce transmission losses, and make the power supply more reliable for both industrial and domestic customers in Samarkand and Bukhara province—which have over four million people, 71% of whom live in the rural area. The population increases at about 2% a year.

The World Bank team reviewed the Environmental Impact Assessment (EIA) study prepared by Uzbekenergo and the design institutes involved with the project's pre-feasibility studies. The EIA was approved by the Uzbekistan State Committee for Nature Protection (SCNP).

The EIA indicated that the Adyr lands in Kashkadarya oblast are ecologically significant for birds, both resident nesting species and migratory species, and that the region is one of the key bird flight routes in Central Asia. Therefore, it recommended adoption of mitigation measures, such as a horizontal profile for the wires and use of bird diverters and deflectors, which are

widely used and accepted as good international practice for reducing bird mortality resulting from transmission lines.

In view of the potential international significance of the area as a major migratory route, the World Bank project task team engaged the services of an internationally recognized consultant specializing is avian risk issues associated with transmission lines to prepare an avian risk assessment/management study to supplement the existing EIA.

The task team and Regional Safeguards Secretariat also agreed that consistent with the World Bank policy on environmental assessment (EA, OP 4.01), the project should be assigned Category A and a supplemental and independent EA (hereafter "supplemental EA") should be prepared to fully comply with World Bank policies related to environment. It was further agreed that results of the avian risk assessment/management study would be incorporated into this supplemental EA, including in the Environmental Management Plan (EMP).

In addition, Uzbekenergo conducted a social impact assessment (SIA) with the assistance of ADB, and to comply with the World Bank safeguards policy on involuntary resettlements (OP4.12), prepared a resettlement action plan (RAP).

This Executive Summary presents the most important points from the SCNP approved EIA, supplemental EA, and avian risk assessment/management study. It is divided into the following sections:

1. Project Objectives and Description
2. Policy, Legal and Administrative Framework
3. Review of the Existing Talimarjan TPP's Environmental Performance
4. The Project's Environmental Impact
5. Avian Risk Assessment
6. The Project's Social Impact
7. Analysis of Alternatives
8. Environmental Management Plan
9. Results of the Public Consultation

Project Objectives and Description

Project objectives

The Talimarjan Transmission Project will help improve and stabilize the power supply from the Samarkand-Bukhara energy hub, reduce losses in transmission lines, and improve the power supply in the region. Once the second and third CCGT units are operating at the Talimarjan TPP (construction is planned for 2011-2014), they will produce 900 MW of power, increasing the total generating capacity to 1,700 MW. At present, the existing 220 kV open switchgear system (OSG) is unable to effectively operate all the units (both those that exist and those being developed) to avoid emergency shutdowns.

The Talimarjan TPP capacity will increase when the two CCGT units are constructed; however, it will still be necessary to construct another 500 kV transmission line from Talimarjan TPP to the grid, to make it more flexible and reduce the possibility of emergency shutdowns.

The 500 kV transmission line from Talimarjan TPP to Sogdiana substation (SS) is designed to offer a double back-up of generation sources (Syrdarya TPP and Talimarjan TPP), a dual back-

up and stable power supply at the Tashkent and Samarkand-Bukhara energy hubs, as well as at the Surkhandarya hub. In addition, it will help reduce power losses as it will improve the reliability of the power supply for Samarkand, Bukahara, Kashkadarya, and Surkhandarya provinces.

Thus, the project development objective is to improve the reliability of the electricity supply to residential and business consumers in southwestern Uzbekistan.

Project description
The project has two components:

Component 1: Strengthening the transmission system. This component will cover the construction of a 500/220 kV new substation at Talimarjan TPP; a 218 km 500 kV single-circuit transmission line from Talimarjan TPP to Sogdiana substation; and a bay extension at Sogdiana substation. The existing Karakul-Guzar line, which passes nearby, would also be linked to this substation by a connecting line.

Component 2: Strengthening the institutions. This component will strengthen Uzbekenergo's project and financial management capacities. Additional technical assistance (TA) may be included based on the needs identified by the assessment of the company's capabilities.

The location of substations and proposed transmission line are presented in Figure 1.

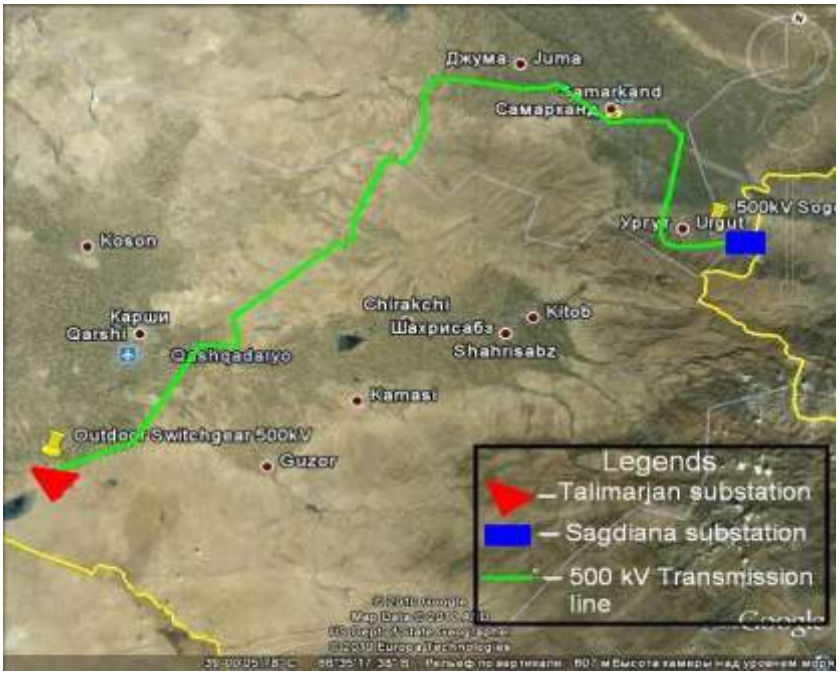

Figure 1: Location of a new OSG-500 kV at the Talimarjan TPP and a 500kV transmission line from OSG-500 kV to the existing Sogdiana SS.

Policy, Legal and Administrative Framework
The legal framework for the protection and management of nature is provided by Articles 50 and 55 in Uzbekistan's Constitution. The country also passed 13 supporting laws and 55 statutes for environmental management, and is party to 13 international and regional

environmental agreements and conventions on air pollution, biodiversity, climate change, desertification, hazardous wastes, ozone layer protection, trans-boundary water courses, and wetlands (the Ramsar Convention).

With respect to environmental protection, the project is subject to various national laws and regulations. The most important are:
"On the protection of nature" (1992), "On the protection and use of flora" (1997), "On the protection and use of fauna" (1997), "On atmospheric protection" (1996), "On solid wastes" (2002) , "On environmental expertise" (2000), and on "The regulation of governmental environmental expertise in the Republic of Uzbekistan" (Cabinet of Ministers' Decree No. 491 from December 2001).

The SCNP is the highest level coordinating authority for State control and inter-sectoral governance, with respect to using and preserving natural resources. The SCNP is accountable to Oliy Majlis (the Parliament).

By the law on "Environmental Expertise," the SCNP is obliged to pursue the following objectives:

- Manage and monitor compliance with the State's environmental impact assessment procedures
- Review and approve environmental impact assessments
- Monitor implementation of conditions specified in the environmental impact assessment approval

In compliance with Appendix 2 to the Cabinet Ministers' Decree of the RUz No. 491, paragraph 13 (December 2001), the national power transmission lines belong to Category I with respect to their environmental impact (high impact risk). The legal framework governing the construction of the OSG-500 kV and 500 kV power transmission lines is the following:

- Cabinet Ministers' Decree No.491 (December 2001) on "Confirmation of regulation of governmental environmental impact assessment;"
- "Instructions for conducting inventories on air pollution and setting air pollution standards for enterprises" (2006);
- Guidelines for calculating air concentrations of pollutants contained in industrial emissions (OND-86);
- Sanitary norms and rules (SNR) on the effects of the electric field generated by overhead transmission lines of alternating currents of industrial frequency (1984);
- SNR on noise protection, State committee on architecture and construction (1996);
- SNR No.0015-94. Maximum concentrations of air pollutants permitted in populated areas within the territory of the RUz, Tashkent (1994).
- SanPiN No. 0056-96 Establishment and maintenance of healthcare institutions of the Republic of Uzbekistan, Tashkent (1996).

Uzbekenergo prepared two EIAs for the project that were reviewed and approved by the SCNP (# 18/532z, in October, 2009 and # 18/149z, in March, 2010 for the 500 kV transmission line; # 18/192 in March, 2010 and # 18/533z in October, 2009 for OSG-500 kV). According to local environmental laws, no added approvals or environmental documents are needed for this project.

Environmental Performance of the Existing Talimarjan TPP

The capacity of the existing Talimarjan TPP is 800 megawatts (MW). The design institute, Teploelectroproject, did the EIA for the first unit in 2000 and in 2001, SCNP approved it, confirming that the technology and environmental mitigation measures met the country's environmental standards and norms.

Within the scope of the World Bank supplemental EA, an independent consultant reviewed the environmental performance of the existing Talimarjan TPP, which must comply with environmental laws in the following areas: (a) limits on discharges to water bodies (approved in 2008), (b) limits on discharges to the atmosphere (2007) and (c) limits on waste disposal (2007). These matters are controlled by Talimarjan TPP staff and the Kashkadariya Province branch of the SCNP.

Water at Talimarjan TPP is used for generating steam, condensing low pressure steam from the turbine exhaust, and drinking. Two types of industrial wastewater are generated: heated water produced from steam condensation and process wastewaters containing oil. Heated water from steam condensation is discharged directly into the Karshi main canal (KMC) during the summer and in the winter a spray cooling system is used (see below) and the cooled waters are recycled. Process wastewaters are first treated in an industrial wastewater treatment center at Talimarjan TPP and afterwards, mixed with domestic wastewater and treated in the sanitary domestic wastewater treatment plant (WWTP). Weekly reviews of the water quality monitoring data, conducted by WWTP staff and quarterly reviews conducted by the local branch of SCNP showed that the quality of the treated water meets maximum discharges allowed for Talimarjan TPP. The "Hygenic Requirements on Quality Standards of Surface Water" provided in the SaniPiN 0056-96" are also met.

During summer, cooling waters are operated on a once-through basis and flows are in the range of 22-25 m³/second. According to the water quality data collected weekly (by Talimarjan TPP environmental experts) and quarterly (by the local SCNP branch), the temperature of the discharged water is 26^0C, which is only 3 to 4 ^{0}C higher than the temperature of the intake water. This conforms to the provisions of the SanPiN No. 0056-96 on "Hygenic Requirements and Quality Standards of Surface Water" according to which the temperature of the water at the control point should not exceed that of the intake water by more than 5^0C. Usually, water losses from the steam cooling cycle are approximately 2% – 3%, representing only 0.5% of the total volume of water in the KMC. However, water losses are higher (up to 10% -12%), during the winter, when a closed-circuit (spray) system is used for steam condensation. The spray system is used to minimize water withdrawal from KMC and consequently reduce the volume of hot water discharged into KMC (10 m3/second). Since the KMC experiences lower flows in the winter, the spray cooling system minimizes the impacts to any fish in the river by reducing the amount of water withdrawn from KMC and ultimately returning it heated into the river.

Based on findings from "Uzbekenergosozlash's'" (under "Uzbekenergo") monitoring at Nuriston in November 2009, noise pollution is lower than limits set both by Uzbekistan law and World Bank requirements. Nuriston is the nearest village to the TPP site, about 500 m. away.

All types of solid waste generated at Talimarjan TPP are properly handled, according to the official document "Limit on Waste Disposal." Scrap metals generated from the scheduled ten year overhaul and routine maintenance and repair activities are recycled in a special plant "Vtorchermet;" waste oil is recycled and reused as a lubricant at the Talimarjan TPP; waste

fluorescent lamps are sent to a special licensed plant, "Ecotibbyot;" where mercury and glass are separated and each disposed according as hazardous and non-hazardous waste respectively. All other types of non-hazardous solid wastes are collected on the TPP territory and disposed of at the Nuristan city landfill.

To assess oil content of the soil in the area where oil was stored until 2004—which is 2 km away from the Talimarjan TPP--samples were collected by the Kashkadarya SNPC local branch in June 2010; the analysis of soil-monitoring data for the last three years indicated that limits were not exceeded (analysis results are presented in the Attachment of the Supplemental EA report).

No environmentally protected areas, archeological sites or historical monuments are on the Talimarjan TPP territory. The nearest is the historical center in Karshi city, which is 37 km away, which contains the Kok mosque, Abdulazaz madrasse, and Yer Kurgan settlement area, among others.

Thus, the review of Talimarjan TPP's environmental performance showed that it operated without exceeding the allowed levels and does not have a negative effect on the environment.

The Project's Environmental Impact

The environmental impact of the OSG 500 kV line at the Talimarjan TPP and 500 kV line from Talimarjan TPP to Sogdiana SS will be observed during different phases of project implementation, through construction and operations/maintenance.

Impact on air

With respect to the impact from the construction of these lines, the main effects on air quality are expected to come from dust generated from transporting materials. Since the new line will be located far from inhabited areas, no impact from dust is expected.

Noise pollution

Estimates for noise pollution during construction were calculated in locations closest to the source, according to Construction Norms and Rules (KMK) 2.01.08-96 "Noise Prevention." Results showed that noise levels at the site and nearest settlement area will meet State Standards (80 dBA and 45 dBA, respectively).[2] The measures to mitigate noise pollution are recommended in the EMP. The noise caused by corona discharge, once the transmission line is operating, is within accepted limits in good weather, but on rainy days, it increases. However, the noise from rainfall masks the noise from the corona discharge. The noise level at 100 m from the last electric phase support was 17.70 dBA, which does not exceed permissible limits.

Magnetic and electric field levels

Calculations with respect to the magnetic and electric field levels showed they are within prescribed norms. The EMP requires that these be monitored during implementation at the substation and along the transmission line to verify the calculations and thus prevent any impacts to humans, fauna and flora.

Impact on water resources

During construction, the impact on water resources will be insignificant. Once the OSG 500kV lines are operating, the water supply (for drinking, production and fire prevention) will be from the Talimarjan TPP water pipes. Wastewater, which is expected to be insignificant, will be

treated at the Talimarjan TPP wastewater treatment system. The EMP contains special measures to prevent pollutant discharges into surface and groundwaters.

When the transmission line crosses bodies of water, electricity pylons will be installed on high platforms on the both sides, in order to minimize their impact on the groundwater. The height of the pylons will ensure that they are above flood levels, thus eliminating the possibility that they could topple into the river during such natural events. During operations/maintenance of the 500 kV transmission lines, no impact on water bodies is expected.

Impact on land

According to the terms of the project, before construction begins on the OSG line, layers of rich topsoil will be removed and placed in temporary piles under the electricity pylons. Once the construction is completed, the soil will be restored and planted. To prevent the topsoil on the slopes affected by the construction from eroding**,** permanent grasses will be planted, afterwards.

All solid wastes generated at the site during construction of both transmission lines will be temporally stored in special structures developed for this purpose; they will be used according to norms stipulated by environmental authorities. The general contractor will be responsible for sanitation, epidemiological and environmental conditions.

It is expected there will be no negative impacts on land resources during operations. With the OSG, liquid wastes will be generated, such as oil from transformers and switches; these will be gathered and sent to the recycling facility. Waste rags will be re-used at the Talimarjan TPP.

Impact on flora and fauna

Construction for the OSG-500 kV line is on the Talimarjan TPP site, where there are no rare plants or animals.

Construction of the project will not affect flora and fauna in Kashkadarya Province, since it will occur along existing roads and facilities. Also, the route will not pass through areas with medicinal and indigenous plants; rather, it will run along the edge of fields to minimize potential damage to crops. The installation of the electricity towers for the 500 kV transmission lines at high elevations and in uplands along both sides of water bodies will have no negative impacts on biocoenosis and ichthyofauna.

Avian Risk Assessment

As previously mentioned, the potential negative impact of the 500kV Talimarjan Transmission Line on birds was studied by an internationally recognized consultant specializing in avian risk issues associated with transmission lines who prepared an avian risk assessment/management study for the proposed transmission line. The international consultant collaborated with the Uzbekistan's Zoology Institute of Academy of Science (UZI). UZI has 70 years of research experience and specializes in bird-related issues in Uzbekistan and the Central Asia region. In recent years the UZI collected substantial amounts of data on migratory bird flight patterns in conjunction with their research efforts tracking avian flu spread in the region. In order to minimize avian risk from the transmission project the international consultant recommended the avian risk assessment/management *strategy* should proceed in the following three stages:

- Stage 1: Desk study to establish the likely level of project related avian risk and recommended risk management measures (to be implemented during project preparation)
- Stage 2: Baseline field monitoring program during the next bird migration season (Fall 2010) prior to any transmission line construction activities to fill any data gaps and identify any high-risk areas (e.g. associated with stop-over sites) requiring special mitigation measures;
- Stage 3: Field monitoring program to assess the effectiveness of mitigation measures on an ongoing basis after the transmission line is energized.

The Stage 1 Desk Study was satisfactorily completed by the international consultant as part of project preparation. Main conclusions of this study are:

(a) the migration corridor is a broad front *without* any "channels" which would lead to high concentrations of bird movement;

(b) the migration corridor intersects the transmission line route for approximately 70 kilometers or about 32 per cent of the proposed transmission line length of approximately 218 kilometers;

c) there are no species moving through the corridor which are endangered or have sufficiently low populations that they would be vulnerable to suffering biologically significant levels of mortality from the transmission line project proposed for this corridor;

(d) of the alternative routes considered, the selected route which is at the lower elevation avoids mountainous areas altogether so it is also the preferable one for minimizing risk to migratory birds;

(e) the bird protection measures outlined in the EMP (e.g. horizontal lay-out and proper spacing of wires; use of diverters and deflectors[1]) are consistent with established international good practice and provide adequate mitigation of the avian risk given the nature of the migratory corridor and the species using it;

(f) within the corridor there may be some areas presenting a higher risk for collision or electrocution of birds, such as sites near water bodies or wetlands used as migratory stop-overs or feeding or nesting sites. These can be identified during the baseline monitoring (Stage 2) and mitigation measures can be applied (e.g. increasing density of bird diverters and deflectors; minor readjustments in the corridor route).

Stage 2 will be conducted prior to any construction. It will consist of a comprehensive baseline field monitoring program conducted during the bird migration season along the route to establish the existence and refine the features of the corridor, confirm or update information on the numbers of birds going though the corridor -- particularly any identified higher risk areas. Based on this information, consultations will be held with bird conservation experts regarding levels of bird mortality during the operational phase (in general and/or for any particular species of concern) which would be considered acceptable vs. unacceptable and requiring remedial action. This information will be incorporated into the EMP as a further refinement during project implementation. The preparation of the first report on the results of the field

[1] Diverters are used to reduce the likelihood of birds in flight colliding with wires; deflectors are used to discourage birds from nesting on transmission towers with the potential for electrocution

monitoring program will be the responsibility of Uzbekenergo and will be a condition of Loan Effectiveness.

Stage 3 will be a field based monitoring program assessing avian impacts (electrocution and collision mortalities) from operation of the transmission line, compared with the target maximum levels identified during expert consultations. Monitoring results will be used to implement any additional mitigating activities above those specified in Stage 2 which may be necessary to further reduce avian mortality. The Stage 3 monitoring program will also be the responsibility of Uzbekenergo and will be included in the EMP which would be an obligation under the Loan and Project Agreements.

As a covenant in the Loan Agreement, if the Stage 3 monitoring program indicates an unacceptable level of bird mortality, Uzbekenergo will consult with the World Bank on necessary further actions.

Social Impacts

During initial social impact evaluations in September 2009, February 2010 and two rounds of public consultations in July 2010, farmers discussed the need to construct a new 500 kV transmission line and 500kV substation. Most, including adult family members who work on the farms, agreed that land acquisition for construction is unavoidable.

Uzbekenergo prepared a Resettlement Action Plan (RAP) for the project with help from World Bank specialists. Based on the RAP data, 114 farms will be affected by the construction, although there are no residences on these plots. The leasers of these farms have formal leaseholder status. Of the total, 83 will not lose more than 1% of their holdings, and the rest not more than 4%.

Compensation for loss of land and agricultural production, including removal and storage of topsoil and restoration of the affected lands, will be covered by Uzbekenergo, which will set aside funds for this purpose.

The amount of compensation will be determined by a multilateral commission led by the municipal administration along with various stakeholders, which include affected farmers. The final date for compensation payment will be set by Province decision within one month after Project funding is available to the contractor.

Analysis of Alternative Routes

When high-voltage lines are constructed, designers try to build them as straight as possible, with few angles along the routes. However, this is technically difficult to achieve because the routes pass through developed areas.

Three routes were considered for the transmission lines. Alternative 1 (218 km) was the route chosen, as it has the lowest social and environment impact. Alternative 2 (196 km), would have been a straighter route; but, over 30% of the line would have passed through mountains, which, although shorter, would raise costs. Alternative 3 (227 km) would run along the existing 500kV transmission line of Karakul-Guzar-SS Sogdiana (more than 70% of the route would pass through mountains).

The assessment of these routes demonstrated that for environmental reasons, Alternatives 1 and 2 would have equal, minimal impact. Neither route crosses environmentally protected

areas or archeological and historical sites; nor do they require resettlement actions. Alternative 1 is more feasible from the technical and economic point of view, as it will require fewer towers. Also, construction and maintenance during operation will mainly use existing roads, which means only a few minor temporary roads would need to be built. Furthermore, it is also the most preferable in terms of mortality risk to migratory birds because it is situated at the lower/flatter lands (avoiding mountains). Alternative 2 would include many sections built in the mountains, which would require construction of a large number of heavy support towers. As mentioned above, this would increase project costs. In addition, routing in mountainous areas is technically more complicated because special drilling techniques and construction of many roads would be needed. The mountainous terrain would create maintenance difficulties during line operation.

Alternative 3 has significant environmental, economic and technical disadvantages; e.g. it would pass through some parts of the Kitab natural park, which is on the International List of Conservation Areas. Further, the part of the route in densely populated areas would require a great deal of resettlement. Also, this mountainous route would increase maintenance costs during operations. As with Alternative 2, construction of many support columns would increase project costs.

Thus, Alternative 1 was considered the more effective route and is the most acceptable environmentally.

The no-construction option. If no 500 kV transmission line and substation are constructed, the power supply in the Samarkand-Bukhara region will continue to be inadequate and unreliable, which will hamper economic growth and decrease the quality of life. Energy losses that occur when power is transmitted over long distances will continue, as will overloading that leads to frequent blackouts.

Environmental Management Plan

The Environmental Management Plan (EMP) details (a) the negative impacts identified in the EIA, (b) the actions required to mitigate them during the pre-construction, construction and operating phases, according to Uzbek laws and World Bank policies, and (c) the monitoring needed to confirm that the mitigation measures have achieved their objectives.

The EMP will be refined as needed during project implementation, following the baseline (Stage 2) monitoring and all EMP modifications will be subject to a “No Objection” by the World Bank.

The project will be implemented by Uzbekenergo, the executing agency. A Project Management Unit (PMU), led by a Project Director, will oversee the effort. The PMU has an environmental engineer who will work closely with the current environmental engineers at TPP. A position of environmental engineer will be created in the transmission line operation company-- “Uzelectroset”-- of the Southwest Cape main administration.

During pre-construction and construction phases, environmental engineers at TPP along with the PMU’s environmental specialist will monitor implementation of the EMP at the sites. They will also prepare monthly reports for the PMU head, who will in turn submit them to the provincial branch of the SNPC and the World Bank. Construction will also be monitored by the Kashkadarya and Samarqand Provinces’ Nature Protection Committees.

As discussed before, to minimize risks to migrating birds, two special monitoring activities will be the responsibility of Uzbekenergo. The first will be conducted before construction begins and will consist of baseline field monitoring during the bird migration season along the route to refine and update some aspects of data concerning the corridor, particularly identification of any higher risk areas. The second conducted during operations, will be a field based monitoring program assessing avian impacts (electrocution and collision mortalities) from operation of the transmission line. Monitoring results obtained during transmission line operation will be used to determine whether avian mortality remains within acceptable limits and to implement any additional mitigating activities necessary to even further reduce observed impacts of avian mortality

TPP's environmental engineers will monitor and prepare reports on the OSG 500 kV operations at the Talimarjan TPP, and submit them to the Kashkadarya Provincial Nature Protection Committee. The environmental engineer of the Unitary Enterprise (UE) "Uzelectroset" of Southwest Cape main administration will monitor conditions and write reports on the 500 kV transmission line Talimarjan TPP - Sogdiana SS operations, and submit them to Samarqand Provincial Nature Protection Committee.

The PMU environmental expert and TPP-West Cape main environmental experts will work together to implement the EMP. This will help build the capacity of Uzbekenergo staff in environmental management and monitoring, not only for this project but for the future. They will hold several training sessions for Talimarjan TPP and West Cape main environmental staff on how to implement an EMP, as well as monitor environmental impacts. This will include monitoring the effects on bird migrations once the 500 kV transmission line is operating.

The principal costs of the EMP are covered in the project budget. Based on experience elsewhere, international best practice measures to mitigate the risks to birds are well established, technically simple and inexpensive.

Public Consultation and Disclosure

Two consultations were carried out in Kashkadariya and Samarkand Provinces because the project was initially categorized as A as a precautionary measure until sufficient data available to determine the true level of risk. The first meetings in Karshi and Samarkand were in early July, 2010. The dates and times were published in the local newspaper *Zarafshon* and announced on television (list of participants and the minutes of both sets of meetings are included as attachments in the supplementary EA). At the meetings, questions were raised about (a) the possibility of studying another alternate route, (b) creating a protected area around the transmission lines, and (c) ensuring that the topsoil in the areas where the lines are constructed will be fertile, afterwards.

The second round of meetings were held in late July, for which dates and times were published in *Zarafshon* and *Qashqadaryo*. At these meetings, Uzbekenergo staff and the independent consultant answered questions raised at the earlier sessions. Also, information was provided about the expected environmental impacts as well as the activities planned to reduce them.

Further, during the preparation of the EIA, meetings were held with representatives of the State Committee, Provincial Committees for Environmental Protection, farmers, local administrations, local settlements, and sanitary/epidemic units.

After the baseline monitoring program is completed, consultations with local and international bird conservation experts will be held. These consultations will, if needed, provide the basis for any refinements to the EMP.

Rational for the Project

The EIA of the construction of the OSG-500 kV line at Talimarjan TPP and the 500 kV line from Talimarjan TPP to Sogdiana SS indicates effects will be temporary and periodic. The current information about bird migrations within Central Asia and, thus, all of Uzbekistan, indicates they will pass through the project area. Since there is little specific data on the daytime migration along the 500 kV transmission line, special studies are needed to identify the areas where the migrations are concentrated in order that the proper structures can be installed to minimize the risks.

The EMP will include measures to mitigate all potential adverse impacts on the environment, mainly those related to the air quality, noise hazard, and land resources —both during construction and operation and avian mortalities during transmission line operation.

The project is designed to provide considerable social and economic benefits for the region, improve the supply of power, and help raise living standards with minimal environmental and social impacts.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Legal Framework in the field of Nature Protection and Management established in Uzbekistan, provides to the citizens the rights and duties specified in articles 50 and 55 of the Republic of Uzbekistan (RUz). Uzbekistan has enacted 13 supporting laws and 55 statutes for environmental management, and is party to 13 international and regional environmental agreements and conventions, including: air pollution, biodiversity, climate change, desertification, hazardous wastes, ozone layer protection, trans-boundary water courses, and wetlands (Ramsar Convention).

The following main legislation documents directed to protect the environment, health of populations and management of nature protection are applicable for this project:

- "On nature protection" (1992) – state legal, economical and organizational bases for conservation of the environment, rational use of natural resources. Its purpose is to ensure balanced relations between human and nature, protection the environment system, natural complex and separate objects, and to guarantee the rights of population for favor environment According to legislation of RUz the Cabinet of Ministries of RUz, SNPC and local government bodies are responsible for implementing state environment protection management and using natural resources.
- "On Environmental expertise" (2000) – the law specifies purposes, objectives, types of environmental expertise, it gives definition of the objects of environmental expertise, lists requirements for environmental expertise as well as materials for its implementation. The law specifies the rights and duties of the environmental expertise expert and its terms of implementation. State Nature Protection Committee is responsible for implementing this legislation. Departments of Environmental Expertise (Glavgosekoexpertiza and Gosexpertisa) under the SNPC and Provincial braches of SNPC are responsible for implementing this legislation.
- "On energy power" (2009) – regulates relations in the field of energetic. The law stipulates critical directions of government policy in the field of electro energy, assigns authority implementing government regulations in the field of electro energy. The law described power producing, supplying and distributing procedures, as well as implementation of operative-dispatch management.
- "On rational use of energy" (1997) – regulates formation of common legal basis directed to conservation of national energy resources, efficient energy use, and improved production capacity;
- "On conserved nature territory" (2004) – regulates relations on organization, protection and use of conserved territories, management of protected nature territories. In the law it is given categories of conserved territories such as integrated (landscape) wildlife preserves, nature parks, state natural objects, areas for protection, conversion and restoration of certain nature objects and complexes, conserved landscape, and territories for managing of some nature resources. SNPC and local government bodies are responsible for implementing state control and on protection nature conserved territory and it's using.
- "On forest" (1999) – describes main objectives for forest regulations, state forest fund, and gives mechanism of state regulations and controls in the field of forest protection, conservation, use and reproduction. The law stipulates the order of forest management, its types, cutting conditions of tree and bush plantations. The Cabinet of Ministries of the RUz, local government bodies, SNPC and Head Department of forestry under Ministry for

Agricultural and Water Resources Management are responsible for implementing forest protection, management and reproduction (Paragraph XXXI of the Law of the RUz dated from 26.05.2000).

- "On protection and use of flora" (1997) – regulates protection and usage of flora, growing in natural condition as well as wild plant existing in culture, to their reproducing and conserving of gene pool. The Cabinet of Ministries of the RUz, local government bodies and special authorized agencies implement state administration of protection of flora and its using. SNPC and Head Department of forestry under Ministry for Agricultural and Water Resources Management are the special authorized agency in fauna protection and it's using. The Cabinet of Ministries of RUz, local government bodies, SNPC and Head Department of forestry are responsible for implementing implement state administration of protection of fauna and its using.
- "On atmosphere protection" (1996) – describes regulations on atmosphere protection and its objectives. It specifies standards, quality and deleterious effect norms, requirements on fuels and lubricants, production and operation of transport and other vehicle means and equipments, ozone layer protection requirements; obligations of enterprises, institutions and organizations on atmosphere protection, compensations for atmosphere pollutions. The Cabinet of Ministries of the RUz, SNPC and local government bodies are responsible for implementing state administration of air management.
- "On solid wastes" (2002) – the principal objectives of this law is to prevent negative effect of solid wastes on population lives and health as well as on environment, reduce wastes generations and their rational use in household activities. The Law regulates the procedure of wastes treatment, authorities of various institutions in the field of rationing the wastes treatment. The law stipulates waste transportation rules and economical aspects on wastes treatment. The Cabinet of Ministries of the RUz, SNPC, Ministry of Health, Uzbek Agency "Uzkomunhizmat", Agency on supervision for safe operation in the industry and mines inspectorate (hereinafter Agency "Sanoatkontekhnazorat") are responsible for implementing of state management in the field of waste treatment.

The main functioning subordinate legislations, regulatory documents approved by Government of the RUz in nature protection sector, are:

- Cabinet of Ministers' Decree No. 491 from 31.12.2001 on "Confirmation of regulation of governmental environmental expertise in the Republic of Uzbekistan";
- Cabinet of Ministers' Decree No. 174 from 27.07.2004 on "Confirmation of regulations on water protection areas in water storage basin and in other water reservoirs, rivers, channel and collector mains, as well as drinking and domestic water supply sources, medical and culture and health purpose in the Republic of Uzbekistan";
- Cabinet of Ministers' Decree No.293 from 27.07.1995 on "Confirmation of tax for calculation of damage recovery caused on flora of the RUz";
- Cabinet of Ministers' Decree No.139 from 01.04.1998 on "national strategy and measures of the RUz on conservation of biological diversity".

Under international cooperation in the field of environment protection, Republic of Uzbekistan signed number of International Conventions which should be undertaken by State Committee for Nature protection of the RUz. This is:

- Convention on desertification control in those countries which suffers from strong droughts and/or desertification, especially in Africa (Oliy Majlis of the Republic of Uzbekistan ratified in 1995);
- Convention on biodiversity (ratified in 1995);
- Convention on international trade of fauna and flora is being endangered species (ratified in 1997);
- Convention on protection of migrant wild animals (ratified in 1998);
- Convention on wetlands of international significance, mainly inhabitant places of waterfowl birds - Ramsar Convention (Uzbekistan jointed in 2001);
- Agreement on protection of Afro-Euroasian migrant wader birds (signed by RUz in 2003);
- Memorandum on mutual understanding of white crane protection measures (1996);
- Memorandum on mutual understanding of slender-billed curlew protection measures (1994);
- Memorandum on mutual understanding of conservation and rehabilitation the Bukhara deer (*Cervus elaphus bactrianus* Lyd) (2002);
- Memorandum on mutual understanding of conservation, rehabilitation and steady use of antelope (*Saiga tatarica* L.) (2006).

Within the Commonwealth of Independent States (CIS), Uzbekistan is a member of Intergovernmental Environment Council on environment law harmonization, EI design and development of economic instruments on nature protection, as well as Intergovernmental Environment Fund for financing nature protection in intergovernmental and regional programs. It was signed the following key agreements:

- Agreement on cooperation in the field of Environment and Nature protected, Moscow, February 8, 1992. (entered into force from February 8, 1992);
- Environment monitoring agreement, Saratov, January 13, 1999;
- Resolution of Head of States of Central Asia on “Main directions of the Program, contrite measures on enhancing economic and social-economic situation in the Aral sea basin within the period 2003-2010”. It was signed on 06.10.2002 in Dushanbe.

State Committee of the Republic of Uzbekistan for Nature Protection (Goskompriroda) is specially authorized supreme and coordinating authority, implementing state control and intersectoral governance in Nature protection, using and reproducing nature resources. Goskompriroda of the Republic of Uzbekistan is under governance of and accountable to Oliy Majlis of the Republic of Uzbekistan.

By the law on “Environmental Expertise,” the SCNP is obliged to pursue the following objectives:

- Manage and monitor compliance with the State’s environmental impact assessment procedures
- Review and approve environmental impact assessments
- Monitor implementation of conditions specified in the environmental impact assessment approval

According to the Regulations on State environmental expertise in the Republic of Uzbekistan

approved by Cabinet of Ministers' Decree of the RUz No.491 from 31.12.2001, states that Goskompriroda on state environmental expertise is:

- Head of administration on state environment expertise of Goskompriroda (Glavgosecoexpertise);
- State environment expertise of the Karakalpakistan Republic state committee for nature protection;
- State environment expertise of Province and Tashkent city committee for nature protection.

Goskompriroda on state environmental expertise is uniform system of state environmental expertise, methodological guidance of which implemented by Glavgosecoexpertise. Glavgosecoexpertise undertakes the state environmental expertise on below objects:

- Pre-project and project documentations, operating enterprises and other objects effecting negative impact on environment and population health, objects with special legal status (on activities belonging to Category I and II);
- Materials of integrated monitoring of the territory for assigning the status of conserving nature territories, emergency environment situation zone, as well as environmental disaster; (Paragraph in the Cabinet Ministers' Decree of the RUz No.95 from 01.04.2005);
- Documentation on creation new types of technique, technology, materials, stuffs, productions;
- Programs of State projects, concept, schemes of location and productive forces development in economic and social sectors;
- Town planning documents for object designing with total 50 thousand population;
- Projects of standard technical and instructional and methodological documents (technical specifications, standards, environmental standards, rules, instructions), regulating economic and other activities connected with use of nature resources.

State environmental expertise of the Republic of Karakalpakistan, Provinces and Tashkent city implements state environmental expertise upon the below objects:

- Pre-project and project documentations, operating enterprises and other objects effecting negative impact on environment and population health, objects with special legal status (on activities belonging to Category III and IV);
- Town planning documents for object designing with total 50 thousand population and below;
- Project of conserved nature territory management plans. (Paragraph approved in accordance with Cabinet Ministers' Decree of the RUz No.95 from 01.04.2005).

In compliance with Appendix 2 to the Cabinet Ministers' Decree of the RUz No. 491, paragraph 13 (December 2001), the national power transmission lines belong to Category I with respect to their environmental impact (high impact risk). The legal framework governing the construction of the OSG-500 kV and 500 kV power transmission lines is the following:

- Cabinet Ministers' Decree No.491 (December 2001) on "Confirmation of regulation of governmental environmental impact assessment;"
- "Instructions for conducting inventories on air pollution and setting air pollution standards for enterprises" (2006);

- Guidelines for calculating air concentrations of pollutants contained in industrial emissions (OND-86);
- Sanitary norms and rules (SNR) on the effects of the electric field generated by overhead transmission lines of alternating currents of industrial frequency (1984);
- SNR on noise protection, State committee on architecture and construction (1996);
- SNR No.0015-94. Maximum concentrations of air pollutants permitted in populated areas within the territory of the RUz, Tashkent (1994);
- SanPiN No. 0056-96 Establishment and maintenance of healthcare institutions of the Republic of Uzbekistan, Tashkent (1996).

3. REVIEW OF ENVIRONMENTAL PERFORMANCE OF EXISTING TALIMARJAN TPP

The capacity of the existing Talimarjan TPP is 800 megawatts (MW), designed capacity is 3200 MW. At the present time once the second and third CCGT units are operating at the Talimarjan TPP (construction is planned for 2011-2014), they will produce 900 MW of power, increasing the total generating capacity to 1,700 MW. The design institute, Teploelectroproject, did the EIA for the first unit in 2000 and in 2001, SCNP approved it, confirming that the technology and environmental mitigation measures met the country's environmental standards and norms. The expertise confirms that technology concept and activities on environment mitigation measures of 1st unit, meet environmental standards and norms of the Republic of Uzbekistan.

Uzbekenergo prepared two EIAs for the project that were reviewed and approved by the SCNP (# 18/532z, in October, 2009 and # 18/149z, in March, 2010 for the 500 kV transmission line; # 18/192 in March, 2010 and # 18/533z in October, 2009 for OSG-500 kV). According to local environmental laws, no added approvals or environmental documents are needed for this project.

In compliance with Appendix 2 to the Cabinet Ministers' Decree of the RUz No. 491, paragraph 13 (December 2001), the national power transmission lines belong to Category I with respect to their environmental impact (high impact risk).

Within the scope of the supplemental WB EIA, the Environmental Performance of Existing Talimarjan TPP was reviewed. The environmental performance of the existing Talimarjan TPP must comply with environmental laws in the following areas: (a) limits on discharges to water bodies (approved in 2008), (b) limits on discharges to the atmosphere (2007) and (c) limits on waste disposal (2007). These matters are controlled by Talimarjan TPP staff and the Kashkadariya Province branch of the SCNP.

Water at Talimarjan TPP is used for generating steam, condensing low pressure steam from the turbine exhaust, and drinking. Two types of industrial wastewater are generated: heated water produced from steam condensation and process wastewaters containing oil. Heated water from steam condensation is discharged directly into the Karshi main canal (KMC) during the summer and in the winter a spray cooling system is used (see below) and the cooled waters are recycled. Process wastewaters are first treated in an industrial wastewater treatment center at Talimarjan TPP and afterwards, mixed with domestic wastewater and treated in the sanitary domestic wastewater treatment plant (WWTP). Weekly reviews of the water quality monitoring data, conducted by WWTP staff and quarterly reviews conducted by the local branch of SCNP showed that the quality of the treated water meets maximum discharges allowed for Talimarjan TPP. The "Hygenic Requirements on Quality Standards of Surface Water" provided in the SaniPiN 0056-96" are also met.

During summer, cooling waters are operated on a once-through basis and flows are in the range of 22-25 m³/second. According to the water quality data collected weekly (by Talimarjan TPP environmental experts) and quarterly (by the local SCNP branch), the temperature of the discharged water is 26^0C, which is only 3 to 4 ^{0}C higher than the temperature of the intake water. This conforms to the provisions of the SanPiN No. 0056-96 on "Hygenic Requirements and Quality Standards of Surface Water" according to which the temperature of the water at the control point should not exceed that of the intake water by more than 5^0C. Usually, water losses from the steam cooling cycle are approximately 2% – 3%, representing only 0.5% of the total volume of water in the KMC. However, water losses are higher (up to 10% -12%), during the winter, when a closed-circuit (spray) system is used for steam condensation. The spray system is used to minimize water withdrawal from KMC and consequently reduce the volume

of hot water discharged into KMC (10 m^3/second). Since the KMC experiences lower flows in the winter, the spray cooling system minimizes the impacts to any fish in the river by reducing the amount of water withdrawn from KMC and ultimately returning it heated into the river.

Based on findings from "Uzbekenergosozlash's'" (under "Uzbekenergo") monitoring at Nuriston in November 2009, noise pollution is lower than limits set both by Uzbekistan law and World Bank requirements. Nuriston is the nearest village to the TPP site, about 500 m. away.

Impact TTPP on air had been observed through analyzing of impact exhaust gases and noise. Other air pollution sources on the surround TTPP territory were not identified. According to noise measurement results conducted by "Uzbekenergosozlash" on November 2009, noise level at the nearest settlement area (Nuristan community, located in 500 m from territory of Talimarjan TPP and in 1000 m from main building) do not exceed noise pollution standards indicated in Sanitarian Norms in Uzbekistan (45dBA).

Although there is no local measurement of the ambient air quality, data are available from Karshi, where ambient air is monitored three times daily by the SCNP. Karshi is the nearest town to TPP and is located some 40 km north of the site. Karshi is a sizable town for the region and will have a number of air pollution sources such as traffic and domestic heating. This will mean that the ambient air quality in the town is likely to be worse than that at the TPP. The land between Karshi and the Plant is flat and uniform and so will be part of the same airshed. The report dealing with the air quality in Kashkadarya province shows that the air quality in Karshi is good compared with the Uzbek norms. The levels of the emissions were measured as follows: Sulfur Oxides - 0.035 mg/m^3 (0,2 mg/m^3 – Uzbek Standards[2](UzSt)), Nitrogen Oxides-0.045 mg/m^3 (0,25 mg/m^3 UzSt), Dust-0.035 mg/m^3(0,35 mg/m^3). Normally, urban areas will have high levels of these emissions because of road traffic and domestic heating. The fact that the levels are low in Karshi is strong evidence that the ambient air quality at Talimarjan for these emissions is good.

All types of solid waste generated at Talimarjan TPP are properly handled, according to the official document "Limit on Waste Disposal". Scrap metals generated from the scheduled ten year overhaul and routine maintenance and repair activities are recycled in a special plant "Vtorchermet;" waste oil is recycled and reused as a lubricant at the Talimarjan TPP; waste fluorescent lamps are sent to a special licensed plant, "Ecotibbyot;" where mercury and glass are separated and each disposed according as hazardous and non-hazardous waste respectively. All other types of non-hazardous solid wastes are collected on the TPP territory and disposed of at the Nuristan city landfill.

To assess oil content of the soil in the area where oil was stored until 2004—which is 2 km away from the Talimarjan TPP--samples were collected by the Kashkadarya SNPC local branch in June 2010; the analysis of soil-monitoring data for the last three years indicated that limits were not exceeded (analysis results are presented in the Attachment).

No environmentally protected areas, archeological sites or historical monuments are on the Talimarjan TPP territory. The nearest is the historical center in Karshi city, which is 37 km away, which contains the Kok mosque, Abdulazaz madrasse, and Yer Kurgan settlement area, among others.

Thus, the review of Talimarjan TPP's environmental performance showed that it operated without exceeding the allowed levels and does not have a negative effect on the environment.

[2] Sanitarian Norms and Rules #0015-96 "List of maximum allowed concentration of pollutants in atmosphere of settlement areas of Uzbekistan"

4. REVIEW OF ALTERNATIVE TRANSMISSION LINE ROUTES

Alternatives transmission line routes will not allow receiving the same benefits from existing infrastructure and other related resources as under exiting one from proposed project.

4.1 Location of OSG-500 kV

As it was mentioned above and shown in the Figure 1, the construction of proposed site is planned to be near Talimarjan TPP on the left bank of the Karshi main canal. Nowadays the territory belongs to Talimarjan TPP.

Figure 2: Location of OSG-500 kV on Talimarjan PPS

Location of OSG-500 kV to the South of TPP (behind existing OSG-220 kV) is unreasonable because proposed transmission line would have to go round residential settlement Nuristan, which considerably increases the costs for construction.

4.2 Routing of 500 kV transmission line

When high-voltage lines are constructed, designers try to build them as straight as possible, with few angles along the routes. However, this is technically difficult to achieve because the routes pass through developed areas.

Three routes were considered for the transmission lines, see Figure 3. Alternative 1 (218 km) was the route chosen, as it has the lowest social and environment impact. Alternative 2 (196 km), would have been a straighter route; but, over 30% of the line would have passed through mountains, which, although shorter, would raise costs. Alternative 3 (227 km) would run along the existing 500kV transmission line of Karakul-Guzar-SS Sogdiana (more than 70% of the route would pass through mountains).

The assessment of these routes demonstrated that for environmental reasons, Alternatives 1 and 2 would have equal, minimal impact. Neither route crosses environmentally protected areas or archeological and historical sites; nor do they require resettlement actions. Alternative 1 is more feasible from the technical and economic point of view, as it will require fewer towers. Also, construction and maintenance during operation will mainly use existing roads, which means only a few minor temporary roads would need to be built. Furthermore, it is also the most preferable in terms of mortality risk to migratory birds because it is situated at the lower/flatter lands (avoiding mountains). Alternative 2 would include many sections built in the mountains, which would require construction of a large number of heavy support towers. As mentioned above, this would increase project costs. In addition, routing in mountainous areas is technically more complicated because special drilling techniques and construction of many roads would be needed. The mountainous terrain would create maintenance difficulties during line operation.

Alternative 3 has significant environmental, economic and technical disadvantages; e.g. it would pass through some parts of the Kitab natural park, which is on the International List of Conservation Areas. Further, the part of the route in densely populated areas would require a great deal of resettlement. Also, this mountainous route would increase maintenance costs during operations. As with Alternative 2, construction of many support columns would increase project costs.

Thus, Alternative 1 was considered the more effective route and is the most acceptable environmentally.

The no-construction option. If no 500 kV transmission line and substation are constructed, the power supply in the Samarkand-Bukhara region will continue to be inadequate and unreliable, which will hamper economic growth and decrease the quality of life. Energy losses that occur when power is transmitted over long distances will continue, as will overloading that leads to frequent blackouts.

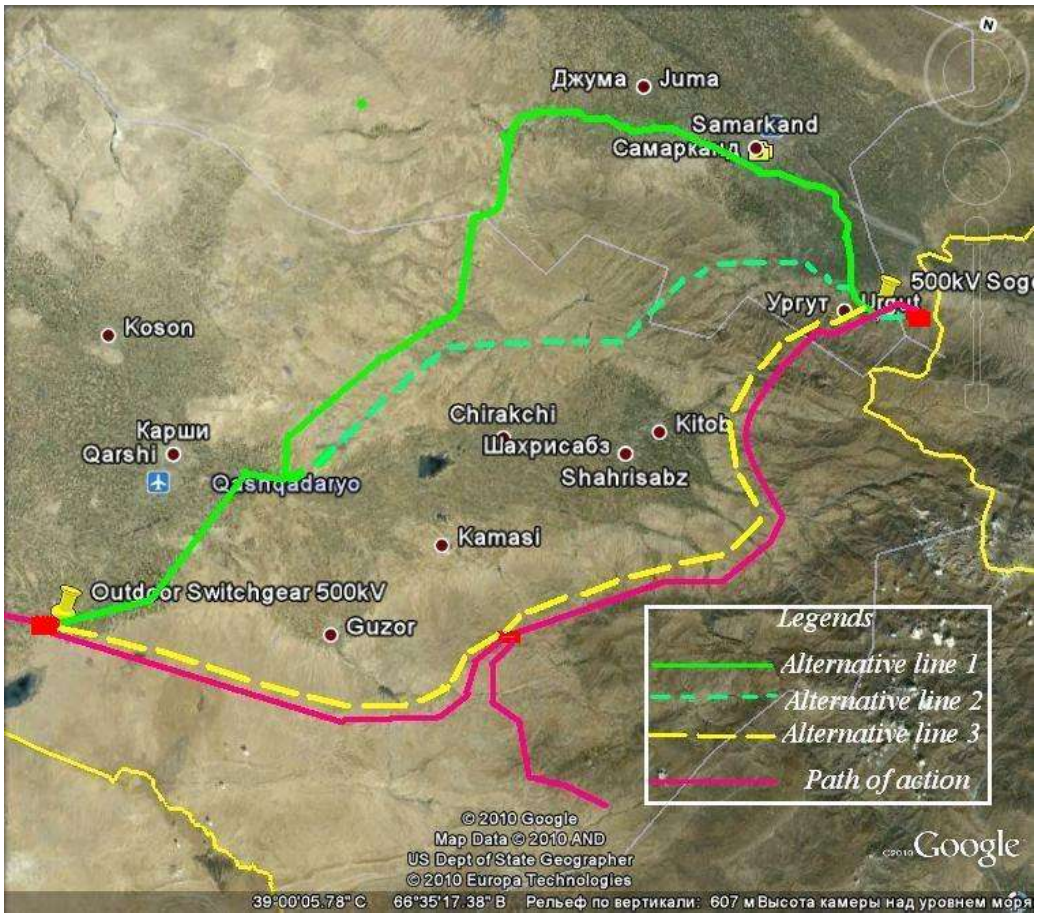

Figure 3: Alternatives of routing of 500 kV transmission line from Talimarjan TPP to Sogdiana SS

Comparative analysis on main criteria, under which the routing of transmission line is guided, is presented given in the Table 1.

Table 1: Comparative analysis routing of 500 kV transmission line

Criteria	Alternative 1 (recommended)	Score[3]	Alternative 2	Score	Alternative 3	Score
Line straightness	Total length of route is 218 km, with 39 corners	3	Total length of route is 196 km. On mountain area routing depends on relief and the angels are much more.	2	Total length of route is 227 km. On mountain area routing depends on relief and the angels are much more.	1
Closeness to the existing ways, laying of temporal road.	Main part of route is being laid along existing roads, only some parts of routes need in construction	3	More than 30 % route laid through mountain areas, practically without roads	2	70% of route is being laid through mountain areas, practically without roads	1
Area marking and environmental conditions	Normal environmental conditions and marks below 1000 m above sea level ensure usage of standard supports	3	Particular ground surface icing with increased wind requires increasing the weight of being used construction support, reducing spans between them and increasing of their quantity.	2	Particular ground surface icing with heightened wind requires increasing the weight of being used construction support, reducing spans between them and increasing of their amounts	1
Existence of rocky	No rocky ground	3	In mountain areas route will	1	In mountain areas	1

[3] Score 3 is the highest and 1 is lowest

Criteria	Alternative 1 (recommended)	Score[3]	Alternative 2	Score	Alternative 3	Score
ground			be laid through rocky ground which requires to conduct boring blasting operations		route will be laid through rocky ground which requires to conduct boring blasting operations	
Crossing minimization with pipelines and railroads	Crossing one gas pipeline and railroads – Samarkand-Karshi	1	Crossing one gas pipeline and railroads – Samarkand-Karshi	1	Crossing one gas pipeline and railroads – Samarkand-Karshi	1
Existence corridor for line construction (250m) and providing in the future sanitary zone transmission line (at least 30 m, and 100 m for developing settlements)	Project route skirts residential buildings and it does not consider resettlement, it is planned only temporal withdrawal the part of farm lands. During construction availability of the corridor provides 30-100 m of exclusion zone	2	Project route is being laid through underpopulated zone, demolition of houses is not considered, it is planned only temporal withdrawal the part of farm lands. During construction availability of the corridor provides 30-100 m of exclusion zone	3	Project route is being laid through densely populated territory and it demolition of major residential buildings for developing corridor, it is planned a withdrawal of farm lands. Particularly, is difficult to routing in mountain areas near to existing route	1
Crossing of	Line crossing through	3	Line crossing through	1	Line crossing	1

Criteria	Alternative 1 (recommended)	Score[3]	Alternative 2	Score	Alternative 3	Score
transmission line voltage line with water courses	Karatepa reservoir storage, Kashkadarya River, Karshi Main Canal, Karasu river, canals and collectors is made not more than by one span, by selecting the most narrow crossing area, by angling of curvature		Karatepa reservoir storage, Kashkadarya River, Karshi Main Canal, along straight line requires passage with installation of one-two span pole in variable and channel part that leads to incensement of emergency risks during operation of routes and it will be result of negative impact on marine and its forage reserve, on water quality and on bottom sediments of the water body or watercourse during constructions		through Kashkadrya River, Taphas River, Langar River. Line crosses natural reserve - Kitab State Conservation	
Total score		**18**		**13**		**7**

5. ENVIRONMENTAL MANAGEMENT PLAN

5.1 Introduction

The Environmental Management Plan (EMP) details (a) the negative impacts identified in the EIA and public consultations, (b) the actions required to mitigate them during the pre-construction, construction and operating phases, according to Uzbek laws and World Bank policies, and (c) the monitoring needed to confirm that the mitigation measures have achieved their objectives.

The EMP will be refined with World Bank approval as needed during project implementation, following the baseline (Stage 2) monitoring and all EMP modifications will be subject to a "No Objection" by the World Bank.

The project will be implemented by Uzbekenergo, the executing agency. A Project Management Unit (PMU), led by a Project Director, will oversee the effort. The PMU has an environmental specialist who will work closely with the current environmental engineers at TPP. A new position of environmental engineer (currently this position doesn't exist in the Southwest Cape Administration's (SCA) staff) will be created in the transmission line operation company--"Uzelectroset"-- of the Southwest Cape main administration to conduct environmental monitoring 500kV Transmission Line Talimarjan TPP-Sogdiana on operating stage .

During pre-construction and construction phases, environmental engineers at TPP along with the PMU's environmental engineer will monitor the implementation of EMP at the sites. They will also prepare quarterly reports for the PMU head, who will in turn submit them to the provincial branch of the SNPC and the World Bank. Construction will also be monitored by the Kashkadarya and Samarqand Provinces' Nature Protection Committees.

As discussed before, to minimize risks to migrating birds, two special monitoring activities will be the responsibility of Uzbekenergo. The first will be conducted before construction begins and will consist of baseline field monitoring during the bird migration season along the route to refine and update some aspects of data concerning the corridor, particularly identification of any higher risk areas. The second, conducted after the transmission line is operating, will be a field based monitoring program assessing avian impacts (electrocution and collision mortalities) from operation of the transmission line. Monitoring results obtained during transmission line operation will be used to determine whether avian mortality remains within acceptable limits and if not, to implement any additional mitigating activities necessary to reduce observed impacts of avian mortality to acceptable levels.

TPP's environmental engineers will monitor and prepare reports on the OSG 500 kV operations at the Talimarjan TPP in compliance with the EMP for OSG, and submit them to the Kashkadarya Provincial Nature Protection Committee. The environmental engineer of the SCA will monitor implementation of the EMP for HV on operating stage including the evidence of migrating birds collision or electrocution to assess the efficacy of the markers and diverters and recommend SCA to install additional marking and the use of diverters on the 500kV Transmission Line Talimarjan TPP-Sogdiana.

The principal costs of mitigation measures indicated in the EMP are covered in the project budget. Based on experience elsewhere, international best practice measures to mitigate the risks to birds are well established, technically simple and inexpensive.

5.2 Environmental Management Plan

Impact Mitigation Plan
Part I: Construction and Operation of OSG at 500 kV at Talimarjan TPP

Environment impact	Mitigation actions	Mitigation expenses (if material ones)	Responsible	Start	End
During construction					
Land use on the substation territory	It is planned to remove the fertile soil layer and store it in the isolated area under plastic cover to prevent erosion and protect from surface waters. After construction is complete the fertile soil layer will be placed back to its original location and original vegetation will be restored. All vegetation will be removed mechanically or manually – no pesticides will be used.	Minimal	Contractor	In the beginning of construction	After completion of construction
Emission of pollutants by construction equipment	A valid emission sticker for all construction equipment would be required.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Dust	The construction site will be sprinkled with water, especially for hot, dry and windy conditions.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Audible noise	Construction activities will be performed only during normal working hours (from 7 a.m. till 7 p.m.). If construction activities have to be performed before or after the specified time limits, the local society must be notified about it at least one week in advance.	Insignificant	Contractor	In the beginning of construction	After completion of construction

Environment impact	Mitigation actions	Mitigation expenses (if material ones)	Responsible	Start	End
Accidental Find of Culturally Significant Artifacts	According to the Law of the Republic of Uzbekistan "On protection and usage of Archeological Treasure" (2009)": the works shall be suspended until found artifact is inspected by representatives of local hokimiyat and archeological expert from Ministry of Culture and Sports.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Worker camps activity	Worker camps will be sited at least: (a) 1 km from any protected areas (international, national, local), (b) 250 m from any surface water bodies. Water for the camps will be provided from local water-supply sources. Bio toilets will be used in worker camps. Wastes of the toilets and waste waters will be collected in special cesspits and pumped out as they are filled and then removed with special transport to the nearest sewerage system or sewage tanks. Upon completion, campsite will be restored and revegetated to as close to the original condition as possible	Insignificant	Contractor	In the beginning of construction	After completion of construction
Non-toxic solid wastes (metal, packing and used equipment, etc.)	To be removed to places specially allocated for landfills, approved by local authorities	Insignificant	Contractor	In the beginning of construction	After completion of construction
PCB (polychlorinated biphenyls)	Tender documents shall prohibit procurement of equipment containing PCB	Insignificant	Contractor	After equipment is delivered	After all equipment is delivered

Environment impact	Mitigation actions	Mitigation expenses (if material ones)	Responsible	Start	End
During operation					
Audible noise	Populated localities must be at least 800 m away from substation Operating personnel must be equipped with ear protectors.	Insignificant	TTPP Environmental Engineer	During operation	Continuous
EMF	All high voltage equipment will be wire-fenced or placed in enclosures. Max EMF intensity outside the protected area: on the residential territory outside of apartment blocks electric field shouldn't exceed 1 kV/m; within territory of outside of residential area (agriculture land, available for transport) – shouldn't exceed 5 kV/m For security reasons the following stationary protection will be used: • shielding-sheds over the disconnector operating mechanisms, • circuit breaker control cubicles, • terminal boxes; • shielding-sheds over walkways of routine inspection.	Insignificant	TTPP Environmental Engineer	During operation	Continuous
Prevent soil and ground water contamination as a result of oil leak	Installation of oil collectors, made in compliance with standard design solutions of precast concrete and reinforced concrete elements, the bottom – monolith reinforced concrete slab made of sulfate-resistant cement. Improved damp proof shall be done underneath the slab.	Insignificant	TTPP Environmental Engineer	During operation	Continuous
Fire prevention	Grass at substation territory shall be mowed; mowed grass shall be removed from the territory of a substation. Plants shall not be removed by pesticides.	Insignificant	TTPP Environmental Engineer	During operation	Continuous
Solid wastes	Solid wastes shall be transported to special disposal places, approved by local government authorities.	Insignificant	TTPP Environmental Engineer	During operation	Continuous

Impact Monitoring Plan

Part I: Construction and Operation of OSG at 500 kV at Talimarjan TPP

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method	Monitoring schedule	Monitoring expenses	Responsible	Start	End
During construction								
Land use on the substation territory	Methods and place of fertile soil storage	Fertile soil storage areas	Visual inspection	Weekly, during site preparation	Insignificant	Contractor	Inspection of site prior to fertile soil removal	After fertile soil removal is over
Emission of pollutants by construction equipment	Valid air emission permit	Entrance to construction site and access road	Visual inspection	During construction	Insignificant	Contractor	The beginning of construction	The end of construction
Dust	Daily inspection	Construction site and access road	Visual inspection	During construction	Insignificant	Contractor	The beginning of construction	The end of construction
Audible noise	dB(A)	Construction site and access road	Noise Meter	During construction or if local residents complain	Insignificant	Contractor	The beginning of construction	The end of construction
Solid wastes (metal, packing and used materials, etc.)	Clarification of Contractor's license expiration date	Prior to access to construction site	Visual inspection	Prior to granting access to construction site	Insignificant	Contractor	The beginning of construction	The end of construction
Accidental find of culturally significant artifacts	If find occurred, were proper procedures followed	Site of accidental find	Visual, interviews with Contractor	Immediately after find occurred, but no later than one day	Insignificant	Contractor	The beginning of construction	The end of construction

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method	Monitoring schedule	Monitoring expenses	Responsible	Start	End
Worker camps activity	❑ Camp location ❑ Drinking water source ❑ Sewage disposal system operation ❑ Camp restoratio n	Campsite	Visual	❑ Prior to constructing campsite ❑ During campsite use ❑ During campsite use ❑ After construction is completed	Insignificant	Contractor	The beginning of construction	The end of construction
PCB (polychlorinated biphenyl)	Invoice for equipment	At delivery site	Visual inspection	When equipment has been delivered	Insignificant	Contractor	Arrival of equipment	Arrival of equipment
During operation								
Audible noise	Distance to the nearest populated localities	Substation site and nearest populated locality	Noise Meter	Quarterly	Insignificant	SCA Environmental Engineer	Start of operation	Continuous
	Usage of ear protectors by the personnel	Control of workers at substation site	Visual	Weekly	Insignificant	SCA Environmental Engineer	Start of operation	Continuous

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method	Monitoring schedule	Monitoring expenses	Responsible	Start	End
EMF	Electric and Magnetic Field intensity	In the area of operation and at the fence	Measurements to be done under the contract with specialized company holding license from Government of Uzbekistan	The measurement will be done once after substation commissioning to verify the compliance with the design parameters (see table below)	Insignificant	SCA Environmental Engineer	Once, in the beginning of operation	-
Operation of the oil filled equipment	Prevent soil contamination with transformer oil	Over the surface and underneath the oil containing equipment	Possible leaks will be inspected visually	Twice daily	Insignificant	SCA Environmental Engineer	Start of operation	Continuous
Fire prevention	Formation of intensive plant cover	At substation site	Visual	Approximately twice/month in summer (depending on rainfall conditions)	Insignificant	SCA Environmental Engineer	During operation	Continuous
Solid wastes	Prevent soil contamination	At substation site	Visual	Daily	Insignificant	SCA Environmental Engineer	During operation	Continuous

EMF intensity, kV/m	Admissible time of exposure, min
Up to 5	No limits
5-10	Up to 180
10-20	Up to 30
20-25	Up to 10
More than 25	Prohibited

Impact Mitigation Plan

Part II: Construction and Operation Overhead Transmission Line Talimarjan TPP – Sogdiana Substation

Environment impact	Mitigation actions	Mitigation expenses	Responsible	Start	End
During construction					
Land use at the tower spots and along the right-of-way	It is planned to remove the fertile soil layer and store it in the isolated area under plastic cover to prevent erosion and protect from surface waters. After construction is complete the fertile soil layer will be placed back to its original location and original vegetation will be restored. All vegetation will be removed mechanically or manually – no pesticides will be used. The works on the OHTL routes passing the agricultural lands will be performed as approved by the land users and during the period when these lands are not covered with the crops or if these crops could be safely protected.	Minimal	Contractor	In the beginning of construction	After completion of construction
Critical/natural habitats and protected areas	In order to get the approval for the final routing, contractor shall invite ecology inspector from SCNP to visit the corresponding route section according to the inspector's jurisdiction. Contractor responsible for final routing shall have a qualified ecologist within the project team to assist them in finalizing the OHTL route	Minimal Minimal	Contractor responsible for final route selection	Final route selection commences Final route selection commences	Final route selection is completed Final route selection is completed
Emission of pollutants by construction equipment	A valid emission sticker for all construction equipment would be required.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Dust	The construction site will be sprinkled with water where possible, especially for hot, dry and windy conditions.	Insignificant	Contractor	In the beginning of construction	After completion of construction

Environment impact	Mitigation actions	Mitigation expenses	Responsible	Start	End
Audible noise	Construction activities must be limited by normal working hours (from 7 a.m. till 7 p.m.). If construction activities have to be performed before or after the specified time limits, the local society must be notified about it.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Non-toxic solid wastes (metal, packing and used equipment, etc.)	To be removed by Contractors to places specially allocated for landfills, approved by municipal sanitary inspection authorities, or to be transported by Contractor, having license for waste disposal.	Insignificant	Contractor	In the beginning of construction	After completion of construction
Quality of the surface water at the river (lake, etc.) crossing	Water protection zone where limited activity mode is applied makes 100 m from rivers. Camps will be located not closer than 250 m from the edge of the river or lake. No waste or waste water removal into the surface water is allowed, therefore the septic pits or dust holes shall be used to be serviced daily. Tower footing shall be located outside the sanitary bank zones of the rivers and lakes. Construction work should be performed at a time when any species in the surface waters will not be spawning or engaging in any other life aspects that are particularly sensitive.	Insignificant	Contractor	Prior to the beginning of construction	After completion of construction
Accidental Find of Culturally Significant Artifacts	According to the Law of the Republic of Uzbekistan “On protection and usage of Archeological Treasure” (2009)”: the works shall be suspended until found artifact is inspected by representatives of local hokimiyat and archeological expert from Ministry of Culture and Sports.	Insignificant	Contractor	In beginning of construction	After completion of construction

Environment impact	Mitigation actions	Mitigation expenses	Responsible	Start	End
Electrocutions and/or collisions of migratory birds with OHTL	To avoid electrocution of migratory birds, spacing between energized and non energized equipment on towers should be at least 4 meters. Install perch and nesting deterrents on transmission lines, at intervals established in the Avian Risk Management Plan. For collisions install markers and flight diverters along high risk bird use areas established in avian risk management plan Avoid bisecting water bodies where possible or placing line next to water bodies.	Insignificant	TTPP Environmental Engineer	Start of operation	Continuous (in accordance with monitoring protocol presented in Avian Risk Management Plan)
Worker camps activity	Worker camps will be sited at least: (a) 1 km from any protected areas (international, national, rayon, or oblast), (b) 250 m from any surface water bodies. Water for the camps will be provided from local water-supply sources. Bio toilets will be used in worker camps. Wastes of the toilets and waste waters will be collected in special cesspits and pumped out as they are filled and then removed with special transport to the nearest sewerage system or sewage tanks. Wastes will be removed to specialized placed allocated for the landfills. Upon completion, campsite will be restored and revegetated to as close to the original condition as possible	Insignificant	Contractor	In the beginning of construction	After completion of construction
During operation					

Environment impact	Mitigation actions	Mitigation expenses	Responsible	Start	End
EMF	All towers should be designed to provide permissible EMF intensity outside the protected area (for 500 kV transmission line- 30m): on the residential territory outside of apartment blocks electric field shouldn't exceed 1 kV/m; within territory of outside of residential area (agriculture land, available for transport) – shouldn't exceed 5 kV/m within territory of outside of residential area (agriculture land, available for transport) – shouldn't exceed 5 kV/m on the site transmission line crossing with roads shouldn't 10 kV/m.	Insignificant	SCA Environmental Engineer	During commissioning of OHTL	After completion of construction
Maintenance and checking of the right-of-way	No herbicides will be used to control vegetation along ROW. Manual or mechanical methods will be used. Burning to clear and control vegetation along ROW is also prohibited	Insignificant	SCA Environmental Engineer	During route alignment	Continuous monitoring
Electrocutions and/or collisions of migratory birds with OHTL	If electrocutions or collisions are found in excess of accepted norms (see monitoring protocol presented in Avian Risk Management Plan), retrofit lines with additional perch and nesting deterrents.	Insignificant	SCA Environmental Engineer	Start of operation	Continuous (in accordance with monitoring protocol presented in Avian Risk Management Plan)

Impact Monitoring Plan

Part II: Construction and Operation Overhead Transmission Line Talimarjan TPP – Sogdiana Substation

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method / type of monitoring equipment	Monitoring schedule	Monitoring expenses	Responsible	Start	End
During construction								
Land use	Methods and place of fertile soil storage; minimum damage during transportation of construction loads	Fertile soil storage areas; access roads	Visual inspection	During construction	Insignificant	Contractor	Inspection of site prior to fertile soil laying	After fertile soil removal is over
Critical and/or natural habitats and protected areas	Evidence of presence or use of areas by rare, endangered, threatened and/or protected species	Within corridor of OHTL	Visual	During finalization of the OHTL routing	Insignificant	Contractor for final route selection	Commencing with final route selection	Completion of the final route selection
Emission of pollutants by construction equipment	Air emission permit; quantity of transport in use	Construction site and access road	Visual	During construction	Insignificant	Contractor	The beginning of construction	The end of construction
Dust	Dust level	Right-of-way for OHTL and access road	Visual inspection	During construction	Insignificant	Contractor	The beginning of construction	The end of construction

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method / type of monitoring equipment	Monitoring schedule	Monitoring expenses	Responsible	Start	End
Audible noise	dB(A)	Right-of-way for OHTL and access road	Noise Meter	In case of claims from population	Insignificant	Contractor	In the beginning of construction	-
Solid wastes (broken insulators, metal, used equipment, etc.)	Clarification of contractor's license expiration date	Prior to access to construction site	Visual inspection	Prior to granting access to construction site	Insignificant	Contractor	The beginning of construction	The end of construction
Quality of the surface water at the crossing of river and OHTL	Oil/lubricants, wastes, suspended materials	Upstream and downstream of the river crossing	Visual inspection	During construction	Insignificant	Contractor	During construction	-
Worker camps activity	❑ Camp location ❑ Drinking water source ❑ Sewage disposal system operation ❑ Camp restoration	Campsite	Visual	❑ Prior to constructing campsite ❑ During campsite use ❑ During campsite use ❑ After construction is completed	Insignificant	Contractor	The beginning of construction	The end of construction
Discovery of cultural values	Excavation works	Construction sites for tower erection	Visual inspection	During construction	Insignificant	Contractor	During construction	-
During operation								

Environment impact	Monitoring parameter	Place of monitoring	Monitoring method / type of monitoring equipment	Monitoring schedule	Monitoring expenses	Responsible	Start	End
EMF	EMF intensity	Under transmission line and on the edge of right-of-way	Measurements under the contract with specialized company	When transmission line is energized	Insignificant	Senior Engineer of the SCA branch	Once in the beginning of operation	-
Collision or electrocution of migrating birds with OHTL	Evidence of migrating birds collision or electrocution (birds stuck in the towers or bird carcasses underneath transmission line)	Selected representative segments of the OHTL and the OHTL right-of-way as established in the Avian Risk Management Plan	Visual inspection using bird mortality monitoring protocol	Inspections to be performed in migration seasons especially during the spring the season of highest bird activity	Insignificant	SCA env. engineer	Start of operation	Continuous
Maintenance of ROW and ROW checking	Verification that only manual or mechanical clearing methods are used	OHTL and the right-of-way	Visual inspection	When clearing activities are scheduled	Insignificant	Senior Engineer of the SCA branch	Start of operation	Continuous

5.3 Institutional Arrangements

5.3.1 Project Institutional Framework

The project will be implemented by the Executing Agency (EA), Uzbekenergo. It will be under the control of a Project Management Unit (PMU), headed by a Project Director appointed by the EA.

Currently, the PMU has two divisions that are responsible for coordinating the associating projects: construction of 2 implementing the CCGT units at Talimarjan TPP and new OSG 500kV at the Talimarjan TPP as well as a 500kV transmission line from the new substation to the existing Sogdiana SS.

In the future, the PMU will work closely with the corresponding departments within the existing TPP organization to achieve the necessary coordination and integration of the two projects with the ongoing operation of TPP Unit 1. The PMU has environmental engineer who will work closely with the existing environmental engineer at TPP. It is planned to create position of environment engineer in the staff member of Unitary Enterprise (UE) “Uzelectroset” of South-West Cape Main Administration to which 500 kV transmission line will be transferred for operation. Environment engineer of PIU will also explain to environment engineers of TPP and transmission line about what impact is expected from OSG and transmission line, as well as what nature protection measures are planned to be undertaken for its mitigation. As it was mentioned, during operation the environment impact from OSG is not expected, it is need to conduct inspection of transmission line on the subject of compliance to the nature protection measures specified in EMP. For efficient implementation of both projects in the future, it is advisable to establish Safeguard Policy Control Department under PMU which consist of environment engineer and social specialist.

The detailed design, construction and commissioning of the new substation at the Talimarjan TPP and a 500kV transmission line from the new substation to the existing Sogdiana Substation will be undertaken through an EPC turnkey contract. The EPC contractor will have primary responsibility for ensuring compliance with the EMP during construction, and for also ensuring that any significant changes to the design and processes are subject to environmental assessment to be reviewed by WB.

5.3.2 Institutional Responsibilities

The following responsibilities are allocated under this EMP:

(i) **PMU.** The PMU is responsible for the overall implementation of the new OSG 500kV at the Talimarjan TPP and a 500kV transmission line to the existing Sogdiana SS in accordance with all project technical and safeguard requirements;

(ii) **Project Director.** The project director is ultimately responsible for the work of the PMU, including the effective implementation of the environmental and social safeguard policy guidelines and statutory requirements during project implementation;

(iii) **PMU Environmental Engineer**. Environmental Engineer will be responsible for the followings:

(a) ensuring that all environmental and social safeguard requirements and all statutory requirements of the Republic of Uzbekistan, are incorporated into relevant specifications;

(b) ensuring that tenders for the contracts incorporate appropriate commitments to comply with safeguard and statutory requirements;

(c) ensuring that contractor complies with all safeguard and statutory requirements during construction, and specifically the EMP, through a comprehensive program of monitoring the contractors' activities and performance;

(d) undertaking monitoring according to the EMP, or ensuring that monitoring is undertaken by the contractors, the TPP Environmental Engineer or other agency, as required;

(e) reviewing the results of all monitoring programs to identify non-compliance issues or adverse trends in results, and putting in place programs to correct any problems identified;

(f) liaising with the TPP Environmental Engineers to ensure that existing and future environmental management systems and procedures are made consistent with implemented project.

(iv) **Talimarjan TPP Environmental Engineer**. Environmental Engineer will be responsible for the followings:

(a) ongoing monitoring of unit 1 operations during construction of the CCGT units and the new OSG 500kV at the Talimarjan TPP and a 500kV transmission line to the existing Sogdiana SS;

(b) undertaking monitoring of projects construction activities identified by PMU Environmental Engineer;

(c) conducting environmental monitoring of OSG operating ad submit reports to province branch of SNPC

(d) liaising with the Environmental Engineers to ensure that existing and future environmental management systems and procedures are made consistent across the new OSG 500kV at the Talimarjan TPP and a 500kV transmission line to the existing Sogdiana SS.

(v) **Environment engineer** South-West Cape Main Administration SWCMA:

(a) conducting environmental monitoring of OSG operating ad submit reports to province branch of SNPC

(v) **EPC contractor**. The EPC Contractor will be required to:

(a) comply with all commitments made in the construction EMP, and ensure that all

subcontractors similarly comply;

(b) undertake periodic monitoring and monthly reporting to the PMU of performance against the construction EMP and this draft EMP.

INSTITUTIONAL ARRANGEMENTS

for OSG 500 kV at the Talimarjan TPP

Action	Institutional Responsibility
Monitoring Data Collection Construction Operation	Construction **Contractor/Environmental Engineer Talimarjan TPP** Operation **Production and Technical Department Talimarjan TPP**
Data Analysis Construction Operation	Construction **Environmental Engineer Talimarjan TPP** Operation **Environmental Engineer Talimarjan TPP**
Environmental Report Preparation Construction Operation	Construction **Talimarjan TPP PMU** Operation **Environmental Engineer Talimarjan TPP**
Environmental Report Receipt/Frequency (Who receives report/how often) Construction **Talimarjan TPP PMU quarterly will submit report to WB** Operation **Environmental Engineer Talimarjan TPP quarterly will submit report to SNPC**	
Management Action Construction Operation	Construction **Contractor/Environmental Engineer TTPP** Operation **Environmental Engineer Talimarjan TPP**

INSTITUTIONAL ARRANGEMENTS

500 kV Transmission Line Talimarjan TPP-Sogdiana

Action	Institutional Responsibility
Monitoring Data Collection Construction Operation	Construction **Contractor/Environmental Engineer Talimarjan TPP** Operation **Environmental Engineer SWCMA**
Data Analysis Construction Operation	Construction **Environmental Engineer Talimarjan TPP** Operation **Environmental Engineer SWCMA**
Environmental Report Preparation Construction Operation	Construction **Talimarjan TPP PMU** Operation **Environmental Engineer SWCMA**
Environmental Report Receipt/Frequency (Who receives report/how often) Construction **Talimarjan TPP PMU quarterly will submit report to WB** Operation **Environmental Engineer SWCMA quarterly will submit report to SNPC**	
Management Action Construction Operation	Construction **Contractor/Environmental Engineer TTPP** Operation **Environmental Engineer SWCMA**

6. AVIAN RISK ASSESSMENT, MITIGATION AND MONITORING

The potential negative impacts of the 500kV Transmission Line Talimarjan TPP-Sogdiana Project was evaluated in the Avian Risk Assessment Report: Potential for Collisions and Electrocutions Associated with the Proposed Talimarjan Transmission Line Project, Uzbekistan October 2010 prepared by Pandion Systems, Inc, and The Institute of Zoology of Academy of Sciences of the Republic of Uzbekistan. To address the potential effects of the 500kV Transmission Line Talimarjan TPP-Sogdiana project on resident and migratory birds, the World Bank has requested that an Avian Risk Assessment (ARA) be prepared. This ARA characterizes the likelihood or potential risks to birds from collisions and/or electrocutions associated with the proposed 500kV Transmission Line Talimarjan TPP-Sogdiana project and determine whether these risks will cause biologically significant adverse effects to resident and migrating birds found in the vicinity of the proposed 500kV Transmission Line Talimarjan TPP-Sogdiana route. This ARA is based on available information and some details but not the conclusion may be revised following preconstruction monitoring studies. The ARA provides a description of the proposed project, its design and location along with a discussion of the avian resources found in the vicinity of the 500kV Transmission Line Talimarjan TPP-Sogdiana route

Some 320 birds species are found in Uzbekistan with most >300 being migrants..Based on the literature of Uzbekistan here is no direct evidence of any narrow flyways of migratory birds parallel to the 500kV Transmission Line Talimarjan TPP-Sogdiana route, however, global flyways of birds occur across a broad front of the entire region of Central Asia and over Uzbekistan. Bird migration in the 500kV Transmission Line Talimarjan TPP-Sogdiana project area is considered to occur along a “broad” migration front over a wide area.Among these species an number have been afforded protection protection (IUCN Red List, 2010). . The following is a list of the key avian species that potentially occur along the 500kV Transmission Line Talimarjan TPP-Sogdiana route and are have been reported to be sensitive to electrocutions and collisions. These species are evaluated in the ARA.

Pelicans

Dalmatian Pelican *(Pelecanus crispus)*

Waterfowl

White-fronted Goose *(Anser albifrons)*

Lesser White-fronted Goose *(Anser erythropus*)

Grey-lag Goose *(Anser anser)*

Ferruginous Duck *(Aythya nyroca)*

Storks

White Stork *(Ciconia ciconia)*

Birds of Prey

Griffon Vulture *(Gyps fulvus)*

Cinereous Vulture *(Aegypius monachus*)

Egyptian Vulture *(Neophron percnopterus)*

White-tailed Eagle *(Haliaeetus albicilla)*

Pallas' Sea Eagle *(Haliaeetus leucoryphus*)

Osprey *(Pandion haliaetus)*

Golden eagle *(Aquila chrysaetus)*

Eastern Imperial Eagle *(Aquila heliaca*)

Spotted Eagle *(Aquila clanga)*

Steppe Eagle *(Aquila nipalensis)*

Short-toed Eagle *(Circaetus gallicus)*

Booted Eagle *(Aquilla pennata)*

Black Kite *(Milvus corshun)*

Marsh Harrier *(Circus aeruginosus)*

Hen Herrier *(Circus cyaneus)*

Montagu's Harrier *(Circus pygargus)*

Pallid Harrier *(Circus macrourus)*

Long-legged Buzzard *(Buteo rufinus)*

Common Buzzard *(Buteo buteo)*

Honey Buzzard *(Pernis apivorus)*

Sparrow Hawk *(Accipiter nisus)*

Kestrel *(Falco tinnunculus)*

Lesser Kestrel *(Falco naumanni)*

Hobby *(Falco subbuteo)*

Peregrine falcon *(Falco peregrinus)*

Merlin *(Falco columbarius)*

Saker Falcon *(Falco cherrug)*

Cranes and Bustards

Common Crane *(Grus grus)*

Demoiselle Crane *(Anthropoides virgo)*

Houbara Bustard *(Chlamydotis undulate)*

The risks of these birds to electrocution and collisions were evaluated by considering habitat conditions along the 500kV Transmission Line Talimarjan TPP-Sogdiana route, factors affect exposure and effects. Risks were characterized and general risk management issues identified.

In regards to injury and death to these species from electrocution, the risks are considered to be of the "Lowest Potential." For the major groups of birds most susceptible to electrocutions are birds of prey. It is unlikely that electrocutions will occur given the spacing in energized and non-energized equipment being proposed for 500kV Transmission Line Talimarjan TPP-

Sogdiana and the much smaller wing to wing dimensions. This spacing will provide more than adequate distance so that it is unlikely that birds will be able to make electrical contact. In addition, the limited or no risk does not considered the efficacy of installing perch guards, which will further reduce the use of the birds of prey for perching, roosting and nesting and ultimately the likelihood of electrocutions and the occurrence of streamers. No population level effects are anticipated.

For collisions, a "Moderate Potential" (not considering mitigation through the use of markers and flight diverters) is characterized for raptors, ducks and geese, and cranes, storks, and pelicans. Although limited mortality may occur no population level effects are anticipated.

The following is a summary of this characterization, monitoring and management recommendations.

Mitigation Recommendations

This avian risk assessment is intended to aid in management decisions regarding ways to further avoid and minimize the risk of collisions and electrocutions. Strategies for addressing collision should ensure the transmission lines are sufficiently visible to birds in flight. Mitigative measures to address risk of collision are warranted and should be identified during final ROW selection and design at the conclusion of preconstruction surveys designed to identify high use areas where collisions may occur. Mitigative measures may include rerouting certain segments to avoid bird high use areas and/or the use of markers and flight diverters to make the lines more visible. These decisions should be done in consultation with the World Bank, Uzbekenergo, and other stakeholders

Strategies for addressing electrocution should ensure distances between energized components or between energized and grounded components are sufficient to avoid electrocution of birds and the use of perch guards to reduce the likelihood of perching, roosting and nesting which in some circumstances lead to "streaming". These collision and electrocution mitigative strategies should be site-specific, where warranted, and tailored to the relative risks in each geographic location along the 500kV Transmission Line Talimarjan TPP-Sogdiana route.

Monitoring Recommendations

This avian risk assessment has identified two monitoring recommendations: a pre- construction habitat monitoring program and a post-construction mortality monitoring program

Preconstruction Habitat Monitoring

The avian risk assessment has identified the potential for certain types of high use bird areas that may be used as stop over sites and feeding areas. It is possible that these areas, depending upon their location and juxtaposition with the 500kV Transmission Line Talimarjan TPP-Sogdiana, could increase the risk for exposure to collisions. If the line is located in the vicinity of these habitats it may be warranted to use markers and/or deflectors to minimize collisions. The objective of this Preconstruction Habitat Monitoring will be to identify the location of these higher use habitats and assess the likely use by the specific groups of birds that are susceptible to collisions. Depending on the location, size and the importance of these habitat recommendations may be made to shift the final alignment to reduce the risk of collisions assuming that such a shift in location does not affect other socio economic resources along the line and are engineering feasible.

The timing for this preconstruction monitoring should occur before final ROW layouts are made. Additional attention should be paid to any areas along the route where natural habitat corridors exist e.g., rivers, wetlands, ecotones, other natural linear features that might be attractive to migrating birds.

Post Construction Mortality Monitoring

Once the line is built periodic monitoring of the line to assess the efficacy of the markers and diverters should be conducted. This monitoring may also show other segments of the line that have higher than expected level of collisions.. These areas would be identified and characterized as to the nature of the risky collisions. Recommendations may be made for additional marking and the use of diverters. Since the major bird use along the line is by spring and fall migrants monitoring is recommended during these periods. During Phase II of this Avian Risk Assessment specific monitoring protocols will be developed in conjunction with IZU (see capacity building below)

7. INSTITUTIONAL STRENGTHENING (TRAINING)

From the information presented in the highlighted sections below prepare a training program that provides the following information (preferably in a Table)

Type of Training or Training Objective	Students		Duration of Training (days/weeks)	Start/End Date	Venue (Domestic or Overseas)	Trainer (Institute, Consultant etc.)	Cost (Foreign or Local)
	Number	Uzbekenergo Unit					
Implementation of EMP	2	1	1,5	Pre-construction period	Talimarjan TPP	PMU, Environmental Engineer	200000 UZS
Impact of high voltage magnetic field to live organisms. Monitoring birds' collusion.	2	2	2 weeks	5 - 14 May	Domestic	Uzbekenergo staff, invited ornithologist Consultant	150 000 UZSx4= 600 000 UZS

The Environmental Engineers of Talimarjan TPP and West Cap Main within Uzbekenergo will be strengthened by building staff capacity through technical support, equipment, and financial resources. The capacity building will:

(i) assist Environmental Engineers of Talimarjan TPP and West Cap Main in supervising and implementing the EMP, which will comprise supervision and evaluation of the work to be undertaken by or on behalf of the EA, with respect to mitigation measures and monitoring requirements;

(ii) provide on-the-job training for Environmental Engineers of Talimarjan TPP and West Cap Main to build technical expertise on environmental and social aspects of environmental management;

(iii) instruct Environmental Engineers of Talimarjan TPP and West Cap Main on proper techniques of project inspection, monitoring, use of field monitoring equipment, and data collection; and

(iv) assist Environmental Engineers of Talimarjan TPP and West Cap Main in coordinating and consulting with other government agencies, local communities, NGOs, and other stakeholders concerned with environmental aspects of the project.

Capacity Building

Several areas of capacity building are possible including increasing the capacity of IZU to undertake both the preconstruction and post construction monitoring. This is most important for post construction mortality monitoring where instruction and training should be provided in developing standardized approaches for collision and electrocution monitoring of transmission lines. If the results of post construction monitoring are to be used for making recommendations for additional retrofitting then the data collected needs to be comparable and corrected for the monitoring biases that exist in mortality monitoring, e.g. scavenger removal, searcher efficiency, habitat and other potential biases.

It is also recommended that training in the use of avian risk assessment techniques for power lines be provided including measures to avoid, minimize and mitigate electrocutions and collisions. This training would be for staff of Uzbekenergo, IZU, and other appropriate stakeholders.

Finally it is recommended that a short course dealing with avian interactions with power lines be developed. Such a course would deal with the engineering and biological issues involving avian collisions and electrocutions, mitigation strategies and remedial techniques for the protection of bird species.

Specific details for this capacity building will be developed in consultation with the World Bank and implemented as a part of the Phase II of this project.

8. PUBLIC CONSULTATIONS

1st round of PCs were conducted during July 1-2, 2010 in Kashkadarya and Samarkand provinces.

8.1 1st Round of PCs in Kashkadarya province

To introduce the community to the proposed project, which is considered a Category I with respect to its environmental impact, two rounds of public consultations (PCs) were held in Kashkadariya and Samarkand Provinces. The first meetings in Karshi and Samarkand were in early July, 2010. The dates and times were published in the local newspaper *Zarafshon* and announced on television (list of participants and the minutes of both sets of meetings are included as attachments). At the meetings, questions were raised about (a) the possibility of studying another alternate route, (b) creating a protected area around the transmission lines, and (c) ensuring that the topsoil in the areas where the lines are constructed will be fertile, afterwards.

Initial works on conducting of PCs started on June 25, 2010 in close collaboration with Kashkadrya Province Hokimiyat, Province Committee on Nature Protection (SCNP) and South – West Cape Main. Brief information about project activities and announcement on intention of conducting of Public Consultations was forwarded to Kashkadarya Province Hokimiyat.

Moreover, Official Invitation Letters were forwarded to the District Hokimiyats about this activity to the following groups: farmers whose lands are laid through or near to the projected route, Sanitary and Epidemiological Station (under the Ministry of Health), District Departments of SCNP, Makhalla Committees of Karshi city, Nuristan settlement, and other districts, and Women Committees.

1st Round of PCs was conducted on July 1, 2010 at 16:00 in the building of Kashkadrya Province Hokimiyat. Representatives of all above mentioned groups as well as District Land Management representatives, residents of Nuristan settlement and other areas through which laid the route, participated in Public Consultations.

8.1.1 Minutes of 1st Round of PCs in Kashkadarya province

Representative of State Joint Stock Company "Uzbekenergo"
Muminova M. – PMU Environmental Specialist, PhD

Representatives of Kashkadarya Province Hokimiyat:
Murodov. Sh. - Deputy Khokim

Representatives of NBT:
Khalmirzaeva M. – Consultant, Environmental Engineer, PhD
Mavlonov Sh – Project Assistant

Subject: Construction of a new OSG 500kV at Talimarjan TPP and 500 kV transmission line from Talimarjan TPP to the Sogdiana SS

Announcement of PCs was aired twice a day during June 29-30, 2010 on local TV of district broadcast in Kashkadarya District (reference document presented in Attachment 2. Before conducting Public Consultations there were arranged meetings with representatives of District Hokimiyats through which 500 KV TL Line is being planned to lay, representatives of Department of Environmental Conservation of Flora and Fauna of SCNP, Deputy of Chairman of SCNP.

During the meeting, the participants were introduced to the Project objectives, goals, and proposed activities. 23 participants attended 1st Round of Public Consultations. Among participants there were representatives of Makhalla (Village) Committees of Nishan, Chirakchy, Guzar, Kamashy and Karshi Districts, as well as representatives of these Districts Hokimiyats, Women's Committee, Representatives of Land Resources Management Committee, SCNP, and Epidemiological Station, Farmers and common residents of above mentioned districts. There were three women at the meeting (List of participants presented in Attachment 3).

Public Consultations began at 16.00 and lasted more than one and half hours. The meeting was opened by Deputy of Hokim Mr. Sh. Murodov who briefly introduced to participants of Public Consultations with the meeting subject and workgroup, conducting consultations.

After, NBT Environmental Engineer, Dr. M. Khalmirzaeva, introduced key information on proposed activities by using Power Point Presentation (Attachment 4). In brief, it was given information on situation in Uzbekistan power-generating sector, planned activities under Project framework, work capacities and financing issue. Upon completion of presentation, participants asked number of questions, and expressed their suggestions on the project.

During PCs the following questions were raised:

No.	Participants' questions / comments	Consultant's feedback
1	In your presentation, you have stated that you consider only one alternative. Why it is not considered, at least, one more alternative? (Province Nature Protection Committee)	In this presentation we presented an alternative line which was considered in the Environmental Assessment prepared by local design institute. However, we are also planning to consider other alternatives within conducting environment assessment after consultations with Project design engineers.
2	Through which farm lands of Chirakchi District, high voltage line is planned to pass along? (representative of Chirakchi District)	Farmlands, through which lines will be laid, were presented by District Hokimiyats and agreed by Land Resources Management Committee Representatives. All related farmers have been already informed about this Project. PMU Environmental Specialist – Muminova M. presented the list of effected farmers, provided by Chirakchi District Hokimiyat.
3	According to the initial plan, TL Line construction will be implemented during 3 years, but during this period the number of farms could be changed. Is this change monitored?	Yes, the final list of farms, whose lands will be effected is under review. Thanks a lot for your advice. This is the first round of consultations, and within this round we mainly consider Environment problems. Social and Land Acquisition issues will be discussed in the 2nd round of consultations.

No.	Participants' questions / comments	Consultant's feedback
4	Will the World Bank pay any compensation for loss of harvests from fields which will be withdrawal during Project implementation? (farmer).	"Uzbekenergo" is Implementation Agency of the Project. All issues regarding compensation will be addressed by this organization.
5	What is the duration of the project implementation?	Total project duration is 36 months. It is proposed to start project implementation in 2011 and complete in 2013.
6	Will power supply service be improved in Kashkadarya province after project implemented, in particular within territory of areas, where high voltage lines is laid through?	The purpose of this Project is to improve power supply system within whole region, as well as in Kashkadarya province.
7	It is good, that you conduct such kind of Consultations. As a representative of Kamashi District Women's Committee, I think it's important to obtain such information on project and conduct explanatory work among my fellow villagers. I suppose, we will organize meetings with all our makhallas by our side, and we will inform them about this project. Where can we obtain detailed information about Project?	As it was mentioned in today's presentation you can contact with Mr. Utkri Kushmuradov, local specialist, and Dr. Muminova M., Environmental Specialist of PMU, for all issues and further suggestions as well as for obtaining additional information. Their contact details were presented within presentation.
8	As an alternative , I suggest to consider possibility of routing along existing route Karakul-Guzar-SS Sogdiana. Probably, this reduces impact on environment as far as there is already existing roads for this line and there will be no need to cut the forest. (Representative of SNPC)	Thanks a lot for suggestions. We will study this alternative in our upcoming Environment Assessment.

Participants repeatedly suggested that this project is important for the region as far as it will provide reduction of power supply shortage in the region. As the same time, it was stated necessity of detailed work on clarification of farm lands territory through which TL Line will be laid.

Consultants informed participants that in case if they have any questions, complaint and suggestions concerning the Project, they can address to following project contact persons Mr.

U.R. Kushmuradov as well as Dr. M. Muminova, Environmental Specialist of PMU (their contact details were given within presentation). All suggestions, questions, and complaint will be registered in the registration book and delivered to experts for feedback. During 2nd Round of Public Consultations on which it is planned to provide results of preliminary environment assessment, there will be feedback for all questions received within that period.

The 1st Round of the Public Consultations was ended at 17:40 after discussion of all questions.

8.2 1st Round of PCs in Samarkand province

Initial works on conducting of PCs it was started June 26, 2010 in close collaboration with South – West Cape Main, Province Committee on Nature Protection (SCNP). Brief information about project activities and announcement on intention of conducting of Public Consultations was forwarded to Samarkand Province Hokimiyat, Province Committee on Nature Protection. Various community groups were informed about 1st Round of Public Consultations under the Project by arranging printed announcement in district newspapers "Zarafshan" issued from June 20, 2010.

Moreover, Official Invitation Letters were forwarded to the District Hokimiyats about this activity to the following groups: farmers whose lands are laid through or near to the projected route, Sanitary and Epidemiological Station (under the Ministry of Health), District Departments of SCNP, Makhalla Committees of Samarkand city, Urgut, Samarkand and Nurabad districts.

1st Round of PCs was conducted on July 2, 2010 at 16:00 in the building of South – West Cape Main. Farmers through whose lands it is being planned to lay TL route, representatives of Samarkand Province Hokimiyat as well as Province Land Management representatives, residents of project district settlement, staff of South – West Cape Main Management, representatives of Province Committee and District Departments on Nature Protection, SCNP.

8.2.1 Minutes of 1st Round of PCs in Samarkand province

Representative of State Joint Stock Company "Uzbekenergo"

Muminova M. – PMU Environmental Specialist, PhD

Representative of Samarkand Province Hokimiyat:

Kholjigitov R. - Chief specialist of Samarkand Province Hokimiyat

Representatives of NBT:

Khalmirzaeva M. – Consultant, Environmental Engineer, PhD

Mavlonov Sh. – Project Assistant

Subject: Construction of a new OSG 500kV at Talimarjan TPP and 500 kV transmission line from Talimarjan TPP to the Sogdiana SS

In Samarkand Province, announcement of Public Consultations was published in "Zarafshan" newspapers issued from June 29, 2010 (reference document presented in Attachment 2). PMU Environmental Specialist, Dr. M. Muminova during June 26-28, 2010 visited Province Hokimiyat, Province Committee on Nature Protection, for primarily explanation of Public Consultations objectives.

During the meeting, the participants were introduced to the Project objectives, goals, and proposed activities. 25 participants participated at the Public Consultations. Among participants there were representatives of farmers of Samarkand, Urgut, Nurabad Districts, as well as representatives of Province Hokimiyat, Representatives of Land Resources Management Committee, SCNP, and Epidemiological Station, and common residents of above mentioned districts.

Public Consultations began at 16.00 in the building of South – West Cape Main and lasted about two hours. The meeting was opened by Chief specialist of Samarkand Province Hokimiyat Mr. Rabimkul Kholjigitov who briefly introduced to participants of Public Consultations with the meeting subject and workgroup, conducting consultations.

After, PMU Environmental Specialist, Dr. M. Muminova, briefly introduced information on situation in Uzbekistan power-generating sector, main objectives and project development directions. Then, independent expert Dr. M. Khalmirzaeva introduced key information on proposed activities by using Power Point Presentation (Attachment 4). It was given information on planned activities under Project framework, work capacities and financing issue. Upon completion of presentation, participants asked number of questions, and expressed their suggestions on the project.

During Public Consultations the following questions were raised:

No.	Participants' questions / comments	Consultant's feedback
1	Will the TL Line pass through Karatepa reservoir? If yes, in what height and how will it have an effect on the reservoir? (SNPC representative)	Design of TL Line was conducted based on Rules on Installation of Power Supply Systems (Tashkent, 2007), which considers safety parameters for minimizing the effect of TL Line to watercourses.
2	During construction of TL Line through reservoir, the 100 m sanitary zone should be provided. Is it considered in the Project?	Yes, certainly. Considering the type of land use and potential development of population community, 30-100 m protected environmental zone should be considered based on Cabinet of Ministers Decree #93 from May 17, 2010 (Rules on protecting objects in power supply systems). Similar norms are considered for watercourses, which should be followed during the design and implementation of projects.
3	We have heard about resettlement of population in the Djam Village. Was population informed about it? (Farmers)	Resettlement of population in the Djam Village was planned according preliminary version of EIA. However, after conducting additional survey, new routing was selected that would not effect the population communities.
4	I am farmer of "Sagan" farm. I have orchard fields, which were developed over the years. I wonder if TL Line will pass through my farmland? (Farmer)	Based on the documents I have today, your farmland will not be effected by TL Line route.

No.	Participants' questions / comments	Consultant's feedback
5	Will TL Line have negative effect to the people whose houses located close to the route? Do population know about it?	Based requirements described in the Cabinet of Ministers Decree #93 from May 17, 2010 (Rules on protecting objects in power supply systems), protected environmental zone should be considered. This is 30 m for 500 Kv TL Line. During and after construction population will be informed about it.
6	Did local official representatives participated during the selection of the TL Line route?	Yes, selection was coordinated with representatives of district hokimiyats and land resources management committee.
7	Will power supply service be improved in Samarkand province after project implemented, in particular within territory of areas, where high voltage lines is laid through?	The purpose of this Project is to improve power supply system within whole region, as well as in Samarkand province.
8	In general, what benefits the population of Samarkand province will receive from the implementation of the Project?	The purpose of this Project is to improve power supply system within Samarknad-Bukhara region, so, Samarkand province will receive more power supply.
8	During the construction some trees will be cut down. How this damage to the environment will be compensated?	After construction, new trees will be plated in the effected territories.
9	Did this project passes local Environmental Assessment?	Yes, the Project has received positive feedback from Glavgosecoexperiza within SNPC. This object belongs to the 1st category of impact on the environment.
10	Is it planned and if yes, how will be re-cultivation affected land after construction? If not, it is necessary to include.	Land re-cultivation is considered and will be included in the environmental management plan. Project Implementation agency will be responsible to conduct the related activities.
11	Who will conduct environmental monitoring of the project?	It is planned that contractor-executor of the project is to meet all requirements of environment project. Implementation of environmental requirements will be observed by PIU environment engineer and the report on their implementation will be regularly forwarded to the World Bank for their examination. At the same time, it is planned scheduled inspection of project construction process, supervisors of Province Committee on Nature Protection. All details of environment monitoring will be stated in the Plan on Environment Management and they will be obligatory for implementation by executing agency.
12	As suggestion, I would like to add that	Information on project will be provided you

No.	Participants' questions / comments	Consultant's feedback
	information on this Project, in exemplification of implementation of Decree of the President of the Republic of Uzbekistan No.1213 issued by 28.09.09, should be extended among population. If you provide information on the Project, we will be able to organize meetings on mahalla level by ourselves, as well as conduct explanatory work among population.	in full content. Moreover, you can contact with Mr. Kuldashev S.R., project specialist, and Mrs. Muminova M., PMU Environmental Specialist, for all issues and further suggestions, which could be raised after today's Public Consultations. Their contact details were given within presentation.

Participants repeatedly suggested that this project is important for the region as far as it will provide reduction of power supply shortage in the region. As the same time, it was stated necessity of detailed work on clarification of farm lands territory through which TL Line will be laid, to pay attention on land recultivation problems after completion of construction.

Consultants informed participants that in case if they have any questions, complaint and suggestions concerning the Project, they can address to following project contact persons Mr. S.Kuldashev (Head of Department of South – West Cape Main in Samarkand city) as well as Dr. M.Muminova, PMU Environmental Specialist (their contact details were given within presentation). All suggestions, questions, and complaint will be registered in the registration book and delivered to experts for feedback. During 2nd Round of Public Consultations on which it is planned to provide results of preliminary environment assessment, there will be feedback for all questions received within that period.

The 1st Round of the Public Consultations was ended at 18:00 after discussion of all questions.

8.3 2nd Round of PCs in Kashkadarya province

The objectives of the 2nd Round of PC was to present for representatives of community the draft results of Environment Impact Assessment (EIA), including feedback to the questions, comments, suggestions, raised during the 1st round of PC. The brief information about project activities and announcement on intention of conducting of PC was forwarded to Kashkadariya Province Hokimiyat. Various community groups were informed about PCs under the Project by arranging printed announcement in district newspapers "Kashkadariya" issued from July 23, 2010, spreading by number of printed copies throughout all districts of Kashkadariya Province.

Moreover, Official Invitation Letters were forwarded by Province Hokimiyat to the District Hokimiyats about this activity ***to the following groups***: farmers whose lands are laid through or near to the projected route, Sanitary and Epidemiological Station, District Departments of SCNP, Makhalla Committees of Karshi city, Nuristan settlement, districts and Women Committees.

The 2nd Round of PC was conducted on July 28, 2010 at 10:00 in the building of Kashkadarya District Hokimiat. Representatives of all above mentioned groups as well as District Land Management representatives, residents of Nuriston settlement and other areas through which laid the route, participated in Public Consultations.

8.3.1 Minutes of 2nd Round of PCs in Kashkadarya province

Representatives of State Joint Stock Company "Uzbekenergo":
Muminova M. – PMU Environmental Specialist, PhD
Toshmakhmatov K. – the head of South-West Cape Main of Kashkadariya Department

Representatives of Kashkadarya Province Hokimiat:
Murodov Sh. - Deputy of Kashkadarya Province Hokimiat

Representatives of NBT:
Khalmirzaeva M. I. – Consultant, Environmental Engineer, PhD
Mavlonov Sh. – Assistant

Subject: Construction of a new OSG 500kV at Talimarjan TPP and 500 kV transmission line from Talimarjan TPP to the Sogdiana SS

On the meeting it was explained the aims of this stage PC as an introduction process of community with the results of initial environment assessment as well as feedback to the questions and suggestions raised during the 1st round of PC. 30 participants attended the PC. Among participants there were representatives of Nishan, Chirakchin, Guzar, Kamash and Karshi District Makhalla Committees as well as representatives of these Districts Hokimiats, Women's Committee, Representatives of Land Management, Committee for Environmental Conservation, Province Epidemiological Station, District Committee for architecture and common residents of above mentioned districts. There were 6 women at the meeting. (Attachment 2).

Public Consultations began at 10.10 at Provincet Hokimiyat and lasted more than one and half hours. The meeting was opened by Deputy of Province Hokimiyat – Murodov Shavkat who in brief introduced to participants of Public Consultations with the conducted theme and workgroup, and pointed the Project value for Kashkadariya Province.

Thereafter, environmental engineer, Dr. Madina Khalmirzaeva, introduced in brief results of environment assessment by using Power Point program (Attachment 3). In the Presentation it was described in detail alternatives and explanation of selection the project route with high voltage line.

In brief, it was given information on key activities on mitigation of negative impact on environment components, terms of conducting environment monitoring and institutional problems of EM.

Further, in brief, by representative of PMU M. Muminova, it was given information on Project value not only for Samarkand-Bukhara Provinces but also for Uzbekistan generally. In addition, it was raised problems on social aspects of the Project.

During Public Consultations the following questions were raised:

No.	Participants' questions / comments	Consultant's feedback
1	What activities are planning to being conducted for land recultivation during and after project implementation?	It is planned to removing the surface layer of the soil, stocking it on the period of routing, then after completing of construction, it is planned to place the soil back. The construction activities will be conducted in accordance with existing construction norms and regulations.

No.	Participants' questions / comments	Consultant's feedback
2	In your presentation you said that during operation of high voltage line the sanitary zone should be kept. What size it should be and by what regulation norms it is regulated?	As I mentioned during presentation, the sanitary zone for 500 kV line is 30 meters from outer main of TL line. This zone size is defined by Cabinet misters' Decree of the RUz from 17.05.2010 on " Concerning Approval of the Rules for puwer supply network protection".
3	Very often, people do not know that high voltage line can harm people's health. Is it planning to conduct explanatory activities among population and who will conduct it?	Explanatory work will be surely conducted – it is part of function Unitary enterprise "Uzelectroset". Moreover, District Hokimiyats, Makhalla Committees are also working with population concerning the matter of construction the lines and labor safety standards, preventing against vandalism accidents.
4	Has the technical project of alternative routes been prepared, about which you mentioned?	No, the technical project has not been prepared. Upon selecting alternative alternatives it was conducted number of consultations with representatives of project institutions who are dealing with detailed designing and upon analyzing all alternatives it was proved the selection of the project line with technical and economical aspects.
5	Why was it selected the very first alternative of routing?	However, routing in the first alternative is longer than in the second alternative, but it is more convenient by technical and economical parameters. As far as the route passes round densely populated areas, and laid through plain and submontane areas, that makes easier the construction and further operation of 500 kV TL lines.
6	We know that farmers and residents of settlements are informed officially about construction of TL. Will the compensation be paid in the case if construction will be continuing after population is informed about intention of beginning the TL line construction?	In the case if construction or other business activities have been started after official confirmation of the population, compensatory payments are not provided.
7	How compensatory payments are being calculated?	It takes the revenue from cropping within the last three years, raising on the cultivated farmlands. The average income is determined for this period. It is calculated the amount of payment for those farmland which is subjected to alienation.
8	Is the final routing approved? If not, when the final alternative of routing will be approved?	The routing is determinated, currently it is selecting the places for route supporting. They should be selected thoroughly taking into consideration soil, hydrological and climate conditions in the region.

No.	Participants' questions / comments	Consultant's feedback
9	Is the corridor required during construction of the route? If yes, with what width?	In accordance with standards, the width of construction corridor is 250 meters.
10	When compensations will be paid? Before or after beginning of construction 500 kV TL lines?	According to the Law of the RUz compensatory payments will be straight before beginning of TL line construction.
11	When construction of TL line is being planned to start? It would be good, if construction works will start during off-season – after harvesting.	It is planned to start construction in 2011. According to the World Bank procedure, after documents on environment and social assessment is published in the official website of the Bank, after 120 days the Bank board of directors will consider proposals under the project and make a decision of financing availability.
12	On this occasion, I would like, one more time, to ask all those present to assist in conducting, in places, explanatory activities on negative impact of 500 kV TL lines on human health who is in direct closeness to them. Also, about the need of complying the sanitary zone, preventing any type of vandalism concerning to the construction objects within all stages – beginning from conducting survey works up to operating period.	

The consultants informed participants that during next several days, the printed copies of the Report on Environment Assessment will be provided to local Hokimiyats, Province Committee for Nature protection as well as it will be published in the official website of "Uzbekenergo".

After having discussed all questions, the 1st round of PC was over at 11:30.8

8.4 2nd Round of PCs in Samarkand Province

The main objectives of conducting the 2nd Round of PC was to introduce the participants with primary results of additional Environment assessment (EA), including feedback to the questions, comments, suggestions, raised during the 1st round of PC. The brief information about project activities and announcement on intention of conducting of PC was forwarded to Samarkand Province Hokimiyat and Province Committee for Nature Protections. Various community groups were informed about 2nd Round of PC under the Project by arranging printed announcement in district newspapers "Zarafshon" issued from July 24, 2010.

Moreover, Official Invitation Letters were forwarded to the District Hokimiyats about this activity ***to the following groups***: farmers whose lands are laid through or near to the projected route, Sanitary and Epidemiological Station, Province and District Departments of SCNP, Makhalla Committees of Samarkand city, Urgut, Samarkand and Nurabad districts.

The 2nd Round of PC was conducted on July 27 at 10:00 at the large hall of South-West Cape Main building. Farmers through whose lands it is being planned to lay TL route, representatives of Samarkand Province Hokimiyat, Nishan, Samarkand and Urgut districts as well as Province

Land Management representatives, the staff of South-West Cape Main Management, District makhalla committee, representatives of Province Committee and District Departments on Nature Protection participated in the PC.

8.4.1 Minutes of the 2st round of PCs in Samarkand Province

Representatives of State Joint Stock Company "Uzbekenergo":
Muminova M. – PMU Environmental Specialist, PhD
Kurbanov F.Z. – Chief engineer of South-West Cape Main
Kuldashev S. – Head of capital construction Department of South-East Cape Main Management

Representatives of Samarkand Province Hokimiyat:
Kholjigitov R. – Chief specialist of Samarkand District Hokimiyat

Representatives of NBT:
Khalmirzaeva M. I. – Consultant, Environmental Engineer, PhD
Mavlonov Sh – Assistant

Subject: Construction of a new OSG 500kV at Talimarjan TPP and 500 kV transmission line from Talimarjan TPP to the Sogdiana SS

In Samarkand Province announcement on conducting the 2nd round of PC was published in province newspaper «Zarafshon» issued from July 24, 2010 (Attachment 5).

On the meeting it was explained the aims of this stage of PC – presenting the results of additional environment assessment. 35 participants attended Public Consultations. Among participants there were representatives of farmers of Samarkand, Urgut, Nurabad districts, Province Hokimiyat, representative of Province Land Resources Management Committee, farmers, the staff of South-West Cape Main Management, Committee for Nature Protection and common residents of mentioned districts (Attachment 6).

The PC began at 10.20 in the building of South – West Cape Main and lasted about one and half hours. The meeting was opened by Chief specialist of Samarkand Province Hokimiyat Mr. Rabimkul Kholjigitov who briefly introduced to the PC participants with the meeting subject and workgroup, conducting consultations.

World Bank representative – Mr. Iskandar Buranov– also explained in brief the objectives of the PC under this project. After it the Head of Department of South-West Cape Main Management - Mr. Sanjar Kuldashev– gave brief information on project, main technological solutions.

Then, Dr. M. Khalmirzaeva, presented the main results of environment assessment, as well as feedback to comments and questions raised during the 1st round of PC, using Program Power Point (Attachment 3). After presentation, participants asked a number of questions and suggestions on the PC subject.

During Public Consultations the following questions were raised:

No.	Participants' questions / comments	Consultant's feedback
1	What benefit will settlements through which the TL line lays receive from implementation of this project?	During project implementation, a significant improvement of power supply system in Samarkand-Bukhara regions is expected.

No.	Participants' questions / comments	Consultant's feedback
		Consequently, it will be improved power supply network in these regions in hole.
2	We have planned construction of bazaar (market) in Urgut district, it has already started. As we recently informed, through main road, leading to the bazaar, the TL line will be routing. Will it obstacle for road traffic, particular for truck transport?	All passages through highways as well as through water bodies and gas mains are strictly regulated in "Rules of installations operating" (Tashkent 2007). All construction works will be undertaken in compliance with these norms. In case if it is required any limits for trucks on highways, it will be installed proper marks.
3	What is sanitary zone of constructed TL line?	The sanitary zone for 500 kV line is 30 meters from outer main of TL line. This zone size is defined by Cabinet misters' Decree of the RUz Paragraph 13 from 17.05.2010 on "Concerning Approval of the Rules for puwer supply network protection".
4	Concerning to the sanitary zone issue. Very often, people do not know that high voltage line can harm people's health. Is it planning to conduct explanatory activities among population and who will conduct it?	Explanatory work will be surely conducted – it is part of function Unitary enterprise "Uzelectroset" (SNR Protection of population against electric field affect, generated by overhead transmission line of alternate current of the industrial frequency, M.1984, item 4.14). Moreover, we hope that District Hokimiyats, Makhalla Committees will also conduct an explanatory works with population concerning the matter of construction the lines and labor safety standards, preventing against vandalism accidents.
5	You have mentioned about planned monitoring of migrant birds. We have some accidence of birds' death in Dekhkanabad and Nishan districts. Will construction of TL line be the result of birds' death?	Yes, there were some accidences of birds' death on power transmission line due to short circuit. But such accidence occurred on 35 and 100 kV TL lines. On the power lines with 220kV and 500 kV voltage, there was never occurred such accidents. It is rather birds damage power transmission line, as far as they can "shut" the line, whereas they do not absolutely suffer.
6	How compensatory payments are being calculated?	It takes the revenue from cropping within the last three years, raising on the cultivated farmlands. The average income is determined for this period. It is calculated the amount of payment for those farmland which is subjected to alienation.
7	Will the alienated lands be taxable?	The alienated lands are tax-free.
8	Is it planned to demolish the houses along the routing in Djam settlement?	According to the letter issued from 02.03.2020 by Design and Development and Research Joint Stock Company "Sredazenergosetproect" "…upon construction of 500 kV TL line "SS Sogdiana

No.	Participants' questions / comments	Consultant's feedback
		– Talimarjan TPP", the route laid through territory of Samarkand and Kashkadariya provinces is not being provided any activities which could affect on residential settlements and could be resulted on resettlement of population".
9	Is there any opportunity of construction of new substation near to high density settlements Djam and etc.?	Construction of new substation is not provided within the framework of this project, but in the future, I suppose, we will solve this problem when it will be possible.
10	Can we replace the type of support from U2K, used on 500 kV TL lines, into anchor type of UDMK-2. As far as the last one is more economical, they require less area and they are easier during operation.	Unfortunately, we are not competent enough to answer this question. However, we will surely consider your suggestion to project institute, which is dealing with this matter.
11	Can we grow and what kind of crops can be grown under TL line?	There are no particular limits, but it is recommended to grow the crops which do not require human processing (SNR Protection of population against electric field affect, generated by overhead transmission line of alternate current of the industrial frequency, M.1984, item 4.3.).
12	I would like to point the importance of conducting explanatory works regularly on places, among population and farmers. Consequently, I would like to make proposal – also to conduct visits on places with population.	Thank you, your proposal is entered in the minutes.
13	Regarding migrant birds – I suggest to provide antibird barrier during construction of TL line.	Thank you for your suggestion. I would like to inform that «Uzbekenergo» signed Agreement with Zoology Institute RUz for conducting monitoring of migrant girds fly during autumn migration, along projected route. Results of monitoring will show the TL line area where birds fly closest with "high concentration". On these areas, the placement of antibird barrier will be recommended.

The consultants informed participants that during next several days, the printed copies of the Report on Environment Assessment will be provided to local Hokimiyats, Province Committee for Nature protection as well as it will be published in the official website of "Uzbekenergo".

After having discussed all questions, the 2st round of PC was finished at 11:40.

Appendix 15: References

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2. Cabinet of Ministers' Decree № 93 dated 17.05.10 «About Statement Electrical Network Sector's Objects Protection Rules"
3. Sanitarian Norms and Rules "Resident's protection from electric field impact, formed by alternating-current overhead line of industrial frequency" Moscow, 1984
4. The Rules for Electrical Equipment Installation, Tashkent, 2007
5. Draft Environmental Impact Report for construction of a 500 kilovolt Outdoor Switchgear (OSG) of the Talimarjan Thermal Power Station (Draft EIA Report), Tashkent 2007
6. Draft Environmental Impact Report for construction of a 500 kilovolt HV Line Sogdiana SS – Talimarjan TPP with 500 kV OSG at Talimarjan TPP (Draft EIA Report), Tashkent 2009
7. Statement by the State Ecological Expertise Panel on the Draft EIA of 18/532 of construction of a 500 kilovolt Outdoor Switchgear (OSG) of the Talimarjan Thermal Power Plant 07.10.09
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9. Regulations no. 2.01.08.96. Protection from Noise. State Committee of the Republic of Uzbekistan for Architecture and Construction. Tashkent, 1996
10. Sanitary Norms no. 0015-94. List of maximum permissible concentrations of polluting substances in the atmospheric air in the residential areas in the territory of the Republic of Uzbekistan. Tashkent, 1994
11. Dolnik V.R., Bolshakov K.V. Primarily picture of Spring nocturnal bird passage over arid and mountain areas of middle Asia, and Kazakhstan ("latitudinal cross-section"). // Spring nocturnal bird passage over arid and mountain areas of middle Asia, and Kazakhstan. Leningrad. 1985. p.260-294.
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