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Republic of Uzbekistan

Pap-Angren Railway Project

Environmental Management Framework (EMF)

Tashkent, 2014

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1. Executive Summary

Project Description

The proposed project will support UTY to build a single 124 km track rail link between Angren and Pap including a 19.2 km rail tunnel through the Kamchik Pass. It will also support the reconstruction by UzEnergo (UZE) of Obihayot power substation and the construction of power distribution lines from Obi-hayot power substation to traction power substations (TPS) at Koshminar and Pap, and from power transmission line Angren -Obi-hayot to TPS Sardala to secure reliable power supply for the new railway line. The government and UTY will provide the bulk of the financing for the project. The Bank will finance the signaling, electrification of the railway line, electric power distribution line, track maintenance equipment, and technical assistance to UTY. Most of the disbursement will occur in the second and third years of the project life because the electrification and the signaling investments will take place after all other civil works are completed. Retroactive financing under standard conditions may be considered to provide UTY and UZE with the possibility to start electrification and signaling activities as soon as possible. Eligible activities and amount of retroactive finance if any will be discussed and agreed at the appraisal stage.

Environmental Impacts and Safeguards Policies

Because of the significance of its impact, the project is rated Environmental Category A as per World Bank environment policy OP/BP 4.01 Environmental Assessment.

World Bank OP/BP 4.01 Environmental Assessment is triggered. The activities under the project are large-scale and involve various types of works and activities: operation of borrow pits, large-scale earthworks, rock blasting, construction of the tunnel, access roads, power transmission lines, etc. All the above activities require full Environmental Impact Assessment (EIA). Also, technical assistance under the project will have to be reviewed from the perspective of potential environmental impacts that may take place as a result of implementation of plans/strategies/recommendations developed within the framework of the TA. This is consistent with the requirements under national law of Uzbekistan. According to the List of activities under which the state ecological examination is conducted (Appendix N° 2 to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan of December 31, 2001 N° 491) "About State Ecological Expertise", railways of national significance refer to high environmental risk (the 1st category of impact on environment), for which the full-scale EIA should be carried out.

Scope of the EIA and the EMF

The Environmental Impact Assessment (EIA) for construction of the railway line and the tunnel was prepared by the Design Institute Boshtransloiha (Uzbekistan). The EIA included the substantive independent inputs/views and conclusions of the specialists from 18 environmental, academic research, nature conservation institutions, agencies and organizations. Consistent with Uzbekistan law, first a preliminary (scoping) EIA was prepared and reviewed by the State Expert Review, which specified additional detailed studies required. The Bank also reviewed this preliminary EIA and provided comments. The EIA was updated taking into account comments from both the State Expert Review and the Bank. The final EIA was approved by the Uzbekistan authorities, but it was determined that some additional information and mitigation measures were required to meet the

Bank's requirements as set out in OP 4.01. Rather than revising than already approved EIA, this additional information has been incorporated into the Environmental Management Framework (EMF) for the project, as described below.

The EMF covers all other components and activities in the project, including the railway line and tunnel, as well as electrification/signaling, construction of power transmission line, operation of borrow pits, river channeling works, bridges and overpasses, etc.). All of the physical works (under Components 2 and 3) will require preparation of stand-alone EIAs under Uzbekistan law, and the EMF provides further guidance for ensuring that these EIAs and site-specific EMPs also fulfill the requirements of OP 4.01.

For projects of "A" category (significant/large-scale environmental impacts) preparation of site-specific EMP takes into account: (i) the main types, extent, location, duration and reversibility of environmental impact, expected as a result of implementation of project activities; (ii) measures of response: prevention, minimization, mitigation, reduction or compensation of negative impacts; (iii) rules effective and timely response; and (iv) mechanisms for implementation of such rules, particularly in human resources, financial resources, responsibilities and competence. Annex 3 (see also Annex C, OP 4.01, format and content) contains the standard table format of EMP, meeting the requirements of the World Bank.

The EMF also serves as a supplemental EIA for the railway line and tunnel, as noted aboveto meet the requirements for a Category A project under OP 4.01. It reiterates the important information from the existing EIA, including baseline data and potential impacts and mitigation measures for all project components, and also provides the additional information and analysis needed (e.g. details on methodology, Mitigation and Monitoring Plans, capacity of the implementing institutions, etc.). Therefore, the EMF will serve as the primary environmental safeguards instrument for the project, to be disclosed and provided for public consultation prior to Appraisal.

An Environmental Audit of works carried out previously was undertaken and its findings are included in the final version of this EMF. Previous visits to ongoing construction sites by the team's environmental specialist indicated that there were no significant issues that would require a suspension of the works, but did identify some needed improvements. The Environmental Audit reviewed progress in these areas and provided specific recommendations for remedial measures. An Environmental Action Plan based on these recommendations was prepared, agreed and is included in this EMF.

World Bank OP 4.12, Involuntary Resettlement. The preliminary assessment of the scope of land acquisition and resettlement has been completed by UTY. The available data suggests that approximately 270 households including farms plots and a few commercial entities are affected. The majority of project affected people are ethnic Uzbeks (90 percent) followed by ethnic Tajiks (8 percent) and Uygurs (2 percent). The demographics of the region are generally mirroring those of above. The average households consist of 5 people. The majority of those employed are currently benefiting from the nearby factory, ore mining and textile facilities. UTY is conducting a socio-economic study to understand impacts on the project affected people and broader social impacts of the project, particularly on women and the most vulnerable. An RPF has been prepared for the project, as well as a RAP covering both land acquisition that has already been carried out and future land acquisition that is already known. As some gaps have been identified between the resettlement implemented to date and the requirements of OP 4.12, an action plan for

remedial measures has been prepared and will be included in the RAP. It is possible that the need for a small amount of additional land acquisition will be identified based on detailed designs. In this case, a separate RAP will be prepared at that time, based on the RPF. Based on the above, OP 4.12 is also triggered.

World Bank OP 4.11, Physical cultural resources.Implementation of the project takes place in part on the territory of ancient settlement Chilhujra of VI century BC – IV century AD, which is, according to scientific conclusion of the research staff of the State Hermitage Museum (St. Petersburg, Russia), of great historical importance and value for archaeology, history and culture of Ferghana valley, Uzbekistan and the entire Central Asian region. The works on the alignment in the fall of 2013 resulted in damage to the site¹. The Bank required from the UTY to stop the works to prevent further damage and prepare the Action Plan for Physical Cultural Resources. Such Action Plan was prepared as a separate document and consulted with authorities responsible for protection of historic and cultural heritage. The site will be surveyed by specialists in archaeology according to legislation of Uzbekistan. If the survey indicates the need for any additional protection measures, these will be put in place before any additional works are carried out that could impact the site. The Action Plan indicates that the alignment should avoid historic and cultural sites as much as possible.

Applicability of OP 7.50 Projects on International Waterways: The issue of applicability of OP 7.50 has been extensively discussed with the Uzbekistan Railway Company (UTY) in event of (i) water abstraction from a tributary of an international waterway being planned and/or occurred, and (ii) pollution or other downstream impacts on a tributary of an international waterway due to river channelization/straightening associated with the project activities. The UTY formally confirmed that no abstraction of water from the Akhangaran and Chadak Rivers (tributaries of Syrdarya River that has a status of international waterway) is planned or necessary. The sources of water supply for all proposed construction activities of the Project are reported to be existing wells (stations Sardala, Razezd 2, Razezd 3 and Razezd 4), water tanks (stations Razezd 1 and Temirjulobod), and existing piped town water supply (stations Angren, Uglesborochnaja and Pap). As outlined in this EMF, precautions will be taken to ensure that there is no impact on the rivers from sewage effluent, erosion from works, or runoff from material stockpiles or machinery. In addition, it has been confirmed that construction of bridges, embankments, and channelization/straightening activities in the area of Akhangaranriver does not trigger OP 7.50. Therefore, the policy on international waterways OP7.50 is not triggered.

Railway Location and Discussion of Alternatives

The railway start/end points are cities of Angren and Pap. Angren is located in Tashkent oblast and has population of 127 thousand people. The city used to be a center of Uzbek coal industry. Pap is a rayon center with population of 25 thousand people, located inthe North-West of Fergana Valley. Within Angren, the project will use the right of way of the existing railroad and new construction "greenfield" section of the project will start from the coal mining area to the East of Angren. The Northern section of the railway (i.e. section between Angren and tunnel portal at km 36) will go along Akhangaran water reservoir and will cross/overpass (bridge or embankment) at least one of the reservoir's small bays. The

¹The alignment makes a cut through the central section of the historic site. The dimensions of the cut are 50 m (width) x 120 m (length). Approximately 10 % of the historic area was damaged (see picture on p. 58).

alignment runs through Akhangaran river canyon/ravine with very diverse and rough topographic profile. The tunnel will start at km 36 and end at km 57 nearby the river Sansalak-Sai. Between km 63 and km 85 the road will go along Gulistan, Altynkan and Chadak villages and the territory of Almalyk ore mining works (non-ferrous metals). Within the Southern section (i.e. section between Chadak and Pap) the railroad will go through agricultural land. Starting km 95, the rail road will enter agricultural non-arable (currently classified as pastures). The last 20 km of the railroad alignment before entering Pap will be through agricultural arable land.

The preliminary assessment of the scope of land acquisition and resettlement done by Design and Surveying Institute of Uzbekistan is not fully disclosed to the team at the moment. The available data suggests that approximately 270 households including farms plots and a few commercial entities are affected. The full social baseline survey will need to be conducted to determine exact estimates. The Resettlement Action Plan is expected to be developed to clearly identifying existing gaps between proposed social impact mitigation measures, including ongoing resettlement and land acquisition and the gap with the Bank's safeguards policies.

Four alternative alignments were considered at initial stage of alignment identification and two alignments were considered at pre-feasibility stage. The tunnel fall/decline in both options is 20/1000. Option A (preferred option) is 123 km long and has two tunnels (19.1 km and 0.2 km) with the range of tunnel altitudes between 1320 m and 1485 m. Option B is 146 km long, has 14 tunnels with total length of 19.5 km with the range of tunnel altitudes between 1799 m and 1895 m.

Impact Mitigation and Environmental Management

For most construction and rehabilitation works under the proposed project, adverse impacts of the proposed activities on the environment would take place during the construction stage, and they include large-scale earthworks (including blasting), soil erosion, generation of noise, air, water, and soil pollution and generation of waste.

One significant potential issue that was identified was radioactive hazard during the tunnel construction in areas known for uranium mining. However, the sampling carried out to date indicates there is no excess of radiation levels in the main tunnel and shafts. A targeted Action Plan for management of the radioactivity risk, including independent monitoring and verification of radioactivity levels in the working zone and designation of sites for disposal of any radioactive materials, has been prepared and is being implemented by the tunnel contractor under the supervision of the engineering consultants. Also the final EIA includes the action plans for: (a) management of radioactivity risk, (b) mitigation of negative environmental impacts in sensitive areas (i.e. potential pollution of rivers and streams, water protection zones), (c) management of borrow pits and sites for waste material, and (d) management of geological risks and emergency situations.

Site-specific EIAs and EMPs will be prepared for bridges, borrow pits, power lines, substations, etc. The EMF provides guidance on key potential risks and mitigation measures to be included in these EIAs and EMPs.

Public consultations and disclosure of environmental documentation

The EMF and EIA, satisfactory to the Bank, will be publically disclosed prior to Appraisal.

The public consultations took place on October 13-14, 2014. Site-specific EIAs/EMPs for other works (aside from the railway line and tunnel) will be prepared and disclosed publicly accessible locations in Tashkent and in project area when the respective feasibility studies are prepared and prior to the commencement of any works on site. The Client will issue a notice in local media regarding the availability of the documents and inviting comments. For works carried out in areas where there are potentially affected people or sensitive sites, the Borrower and/or Contractor will also organize local public consultations. The Environmental Audit, and the resulting Environmental Action Plan, is completed and incorporated into the EMF prior to Negotiations.

Conclusions

The project will have a number of important environmental impacts during construction and operation periods. With appropriate mitigation referred to in the EIA and EMF, particularly during the construction phase of the project, project activities will have moderate impacts. It should be pointed out that the railroad will bring numerous social and economic benefits to the communities within the area. The EIA and EMF list a number of recommendations on follow-up EIAs and EMPs, and preparation of mitigation measures.

2. **Project Description**

The proposed project will support UTY to build a single 124 km track rail link between Angren and Pap including a 19.2 km rail tunnel through the Kamchik Pass. It will also support the reconstruction by UzEnergo (UZE) of Obihayot power substation and the construction of power distribution lines from Obi-hayot power substation to traction power substations (TPS) at Koshminar and Pap, and from power transmission line Angren - Obi-hayot to TPS Sardala to secure reliable power supply for the new railway line. The government and UTY will provide the bulk of the financing for the project. The Bank will finance the signaling, electrification of the railway line, electric power distribution line, track maintenance equipment, and technical assistance to UTY. Most of the disbursement will occur in the second and third years of the project life because the electrification and the signaling investments will take place after all other civil works are completed. The financing of the Pap-Angren investment was described in the President Resolution Nº 1985 dated June18, 2013 that also set out the implementation arrangements for the project.²

The project has following components:

Component 1. Rail Main Infrastructure (estimated total cost US\$1,396.77million):UTY is responsible for the construction of the new railway line main infrastructure including ballast, rail, bridges and a 19.2 km long tunnel. The construction work was initiated in June 2013 and commissioning is planned by July 2016. The proposed loan does not fund this portion of the project. The financing mainly comes from UTY own funds and the State budget. China Exim Bank participates in financing of the construction of the railway tunnel (total cost of the turnkey contract is US\$455 million), providing a loan to UTY in the amount of US\$350 million³.

Project Components 2-6 will be financed by the World Bank

Component 2. Rail Electrification, Signaling, Track Maintenance and Railway video surveillance system (estimated total cost US\$267.5⁴ million, of which IBRD loan in the amount of US\$152 million): This component will finance four investments to equip and maintain the new railway line as follows:

• Signaling and Communications (estimated IBRD financing US\$46 million). The subcomponent will finance a microprocessor based train control system with fiber

²The total project cost was originally estimated at US\$1,730.3 million of which about US1,018.5 million from UTY own funds and the State budget, US\$242.5 million was financed from the Fund for Reconstruction and Development of Uzbekistan, US\$350 million was financed from China Exim Bank and US\$119.3 million was planned to mobilize from other IFIs. The participation of the World Bank evolved later on from the initial request by the Borrower for US\$200 million IBRD loan to US\$195 million to finance power distribution line (US\$35 million under UZE responsibility), signaling and communications, electrification, track maintenance equipment, technical assistance to UTY, and implementation costs (US\$160 million under UTY). As of now, the total project cost estimate is US\$1,709.13² million without taxes and duties and including US\$20 million earmarked for price and physical contingencies.

³ UTY entered into the contractual arrangement with "China Railway Tunnel Group" (the Contractor) in June, 2013. The total contract size is US\$450 million, out of which US\$350 million is from the China Exim Bank loan and the rest is from the UTY budget. According to the contract implementation schedule, the contract activities, which include design, supply, construction, installation and commission of the railway tunnel, are scheduled to be completed in July, 2016.

optic-based communications. The system would be controlled from UTY's existing dispatching center in Tashkent. UTY will carry out the related civil works (buildings, cable ducts and cable laying). The strategy is to procure the signaling and communication through a supply and install contract with one of the world-wide leading suppliers. The procurement of the signaling system will be based on the latest technology and will benefit from the experience recently developed under other World Bank-financed project (e.g., Azerbaijan Rail Trade and Transport Facilitation). The tendering for the signaling contract is being prepared and should be launched during fall 2014 so that the contract can be signed by effectiveness.

- Electrification (estimated IBRD financing US\$30 million). The sub-component will finance (a) turnkey construction of three traction substations and (ii) a SCADA system for optimizing energy use. UTY will construct the catenary structure and install the cabling. The power supply will be 25 kV AC. The same strategy as for signaling will apply with a supply and install procurement that is being finalized and should be ready to launch during September 2014. Provided retroactive financing is put in place, the contract is expected to be implemented before effectiveness so that the schedule imposed on the project by the Presidential decree № 1985.
- Track Maintenance Equipment (estimated IBRD financing US\$36 million). Track maintenance equipment will be used to maintain the new Pap-Angren line and will consist of cranes, rods, emergency and security trucks, and other machinery and maintenance equipment. The procurement related to this activity is not on the critical path. Therefore it will be initiated last, probably by the end of fall 2014.
- Railway video surveillance and broadcasting system (estimated IBRD financing US\$20 million): The sub-component will finance surveillance system that will record video information to digital means, video broadcasting on any telecommunication channels, and support management of information to railway users.
- A US\$20 million contingency is added to this component and embedded in the financing of the project.

UTY will provide financing for the related civil works (buildings, cable ducts and cable laying).

Component 3. Power Distribution Line (estimated total cost US\$36.86⁵ million of which IBRD loan in the amount of US\$35 million): This component will finance three investments to bring energy to the new railway line as follows:

- Dismantling of overhead power lines (estimated IBRD financing US\$2.6 million), including the removal of Angren-Obihayot 220kV power line of total 8.8 km length, of which 6 km in Tashkent region and 2.8 km in Namangan region.
- Equipment for the installation of new power lines (estimated IBRD financing US\$13.3 million), including the procurement of concrete structures for 110-220kV power lines, respective materials and communication equipment, protection relay, metering and controlling instruments, general power equipment and others.

⁵Including VAT

- Construction works and commissioning of new power lines (estimated IBRD financing US\$17.6 million). The sub-component will finance the reconstruction of the 220 kV substation Obi-hayot and the construction of 15 km and 48.8 km of 110kV power distribution lines to connect Obi-hoyotpower substation with TPSs Koshminar and Pap, and 5 km of 220kV power distribution line to connect 220 kV power transmission line Angren Obi-hayotwith TPS Sardala.
- Other capital costs associated with construction works (estimated cost US 1.5 million).

The pre-feasibility study has been prepared and being finalized by the Design and Surveying Institute "Sredazenergosetproekt, JSC". It is planned to reconstruct the existing Obi-hayot power substation to ensure the reliable power supply to two traction power substations (TPS) at Koshminar and Pap. The upgrade of the 220 kV substation Obi-hayot will include (i) the replacement of two 125 MVA auto-transformers with 220/110/10 kV voltage to two 200 MVA auto-transformers, (ii) the replacement of existing air circuitbreakers to the modern SF6a and the outdated current transformers and disconnectors to a new one and other relevant equipment at 220 kV and 110 kV voltage, and (iii) an extension of the 110 kV switchyard for 4 liner bays to connect TPS Koshminar and Pap. The 15 km 110 kV power distribution line will be constructed to connect Obi-hayot substation with TPS Koshminar, 48.8 km of 110kV power distribution line to connect Obi-hayot substation with TPS Pap, and 5 km of 220kV power distribution line to connect 220 kV power transmission line Angren - Obi-hayot with TPS Sardala. There are no specific technical issues associated with the construction of the electric power distribution lines. Those works are very standard activities of UzEnergo. No specific environment or social issues have been identified during the preparation of the project.

Complex of works on construction of transmission line (TL) consists of the stages carried out sequentially:

- preparatory works (staking of pole centers and TL route axis, reorganization of engineering structures at TL route, construction of temporary roads, sites and delivery of materials along the route);
- construction works (organization of pits, earth and drilling-and-blasting works, organization of foundations and grounding devices, assembly, installation, adjustment and fixing of poles);
- installation works (rolling and connection of wires and cables, their lifting to poles, tension and fixing on poles, installation of dampers of vibration and remote rakers, installation of hinges and lightning-protection devices);
- commissioning and putting of TL into operation.

Construction of the sub-station at Sardala will require careful mitigation measures, given the location of the construction site near Akhangaranriver. Construction of the object has no scopes with difficult and undeveloped technology and does not require special equipment or devices. All installation and construction works should be performed according to the standard technological requirements for power construction, as well as according to KMK 3.01.02-00* "Safety measures in construction", "Instructions on design of fire protection at power enterprises" and to other normative documents. At works near the equipment in operation and TL it is necessary to follow "Safety rules at operation of electric devices" section 23 "Permit of the personnel of construction organizations to works at operating electric devices and in security zone of transmission line." All works will be implemented in compliance with Word Bank safeguard policies and this EMF.

As the area of the route is developed long ago, the designed TL mainly pass through developed lands. Despite this, TL routes are chosen taking into account the requirements of land users and causing the minimum damage to environment.

TL routes will be built, whenever possible, taking into account preservation of fertile lands and green plantings. At the sites where line passes over gardens, the poles are established on the borders of their territory. The required by REDI (Rules for Electric Devices Installations) dimension from the tree crownto TL wires – 4m above all trees is observed. Thus, mulberry and fruit trees crossed by TL route are not subject to cutting down. When using TL they should be cut to the acceptable height.

In order to avoid death of birds from electrical shock at traverses of TL poles and wires between TL poles over each supporting bunch bird-protection devices are installed. Bird protection should be taken into account in the EIA for TL. Technological process of transmission and distribution of power in normal operational conditions is waste-free and is not accompanied by harmful emissions into air or water environment.

In cases of possible damages at TL resulted in accidents (falling of a pole or wire break), there will be no negative impacts on residential areas: the TL is passing at a distance from settlements.

As the whole route is, mainly, at considerable remoteness from settlements, traffic of construction machinery, noise and vibration from cars will not affect health and efficiency of inhabitants.

Construction and installation works are standard, environmental impacts will be local and manageable. The contractor should take all necessary precautionary measures to prevent impact on natural landscape.

After completion of works all areas with natural vegetation will be restored, all construction wastes will be disposed.

Reconstruction of the sub-station at Obikhayot involves decommissioning of two transformers (produced in 1969 and 1974)6. The decommissioned transformers will be transported to other locations and installed/commissioned to operation. Decommissioning of the transformers involves discharge of oil from old transformers. Special mitigation measures should be put in place to avoid and clean up oil spills during decommissioning and transport of oil to new locations. Alternative solutions should be considered in order to decide whether old transformers should be used at all or replaced by new ones in these new locations.

Technical Assistance

This section also covers potential environmental aspects which may be taking place as a result of technical assistance under Components 4 and 5.

Component 4. Technical Assistance to UTY for railway construction and long-term plan (estimated total cost US\$6.7 million, which will be financed by IBRD): This component will finance technical assistance to be provided to UTY. It will provide UTY with options on how to better meet current and future transportation needs, maintain its market share in

⁶The transformers do not contain PCBs (persistent organic pollutants).

freight and passenger transportation and increase efficiency of its operations during the period of 20-25 years. To that end, the technical assistance will focus on: (i) developing effective and modern marketing functions; (ii) improving financial management systems; and (iii) facilitating human capacity development among UTY staff. ECAPDEV funded activities will assist in finalizing the scope of each of three pillars. The prepared TORs will be discussed and agreed with UTY prior to negotiations.

Component 4 will finance technical assistance to UTY. The project design is such that it allow a focus on strategic activities limited in scope to support the project development objectives, and consistent with the capacity building objectives agreed with UTY. Important effort was made by UTY to reflect the institutional dialogue with the World Bank during the project preparation. Overall, this component will increase logistic opportunities and result in a reduction of transportation costs with lower footprint on environment.

Railways will aim at preserving at least 30 percent market share in freight transportation and increase its share in passenger transportation to 8 percent. Consistent with Vision 2030, large investments such as the Pap-Angren Railway Project coupled with institutional reforms are expected to increase productivity of UTY by 10-15 percent. This is expected to strengthen position of the UTY in the competitive regional market. Vision 2030⁷ sets high standards for the transport sector aiming at development of transport infrastructure, management and logistics to achieve more efficient and reliable movement of people and goods in support of sustainable economic growth and stronger trade competiveness. The Technical Assistance to UTY will focus on (i) enhanced logistic systems, (ii) modernized marketing arrangements, (iii) capacity development, and (iv) improved financial management systems.

While overall environmental effects of enhanced effectiveness of railway system will be positive, there are potential environmental implications of different scale locally, associated with long-term enhancement of the efficiency of operations of the railway system broadly as a result of TA under Component 4. These may include cumulative environmental pressure of railway infrastructure due to intensification of operation, regional, and/or site-specific aspects. Specifically, these effects may include expanded spatial footprint of railway-associated infrastructure (warehouses, electricity, engineering and communications facilities and infrastructure), increased water use and generation of larger amounts of wastewater, waste management issues and general environmental performance of various facilities and transport systems associated with railroad. This aspect should be considered in local and regional spatial development plans and appropriate mitigation measures developed, as necessary. Specifically, the TORs for the TA activities should spell out the requirements regarding environmental sustainability of the planned improvements, spatial expansion of operations, intensification of transport flows of goods/passengers and call for preparation of measures for risk mitigation.

Component 5. Technical Assistance to UTY for improving railway logistics in the Ferghana Valley and Angren region(estimated total cost US\$1.00 million, which will be financed by IBRD): This component will finance technical assistance to be provided to UTY. It will support UTY in introducing sound logistics arrangements to allow the Pap-Angren railway link to reach its full operational potential. The technical assistance will encompass traffic

⁷Uzbekistan Vision 2030; Modernization of Transport Sector: A Backbone to Economic Growth and Trade Competitiveness. May 2014. Tashkent. The Vision Statement for 2030 is: *Uzbekistan will develop transport infrastructure, its management and logistics system for a more efficient and reliable movement of people and goods to support sustainable economic growth and strengthen trade competiveness.*

forecasts, supply chain analysis and intermodal development plans to be developed with involvement of UTY, Ministry of Economic Development and local administrations. ECAPDEV funded activities will assist in finalizing the scope of this component.

Component 5 will finance technical assistance to be provided to UTY to address the new logistics challenges associated with the opening of the new line. The new line will provide an opportunity to improve UTY level of service delivery as it would stretch Uzbekistan's railway network further East and would connect the Ferghana Valley to new international and domestic markets. The unprecedented opportunity provided by the newly constructed railway route to/from the Valley, calls for UTY to ensure that reliable, efficient and effective transport organizations and traffic capacity are in place when the line will start operations. It is expected that with construction of the new railway line the new customers such as chemical products, textile and agribusiness industries would be interested in developing higher level of reliability in supply and distribution by using rail services. However, those potential new customers will require UTY to develop innovative products and use modern equipment and technologies, as a number of these new customers currently use door to door transportation (even on long distance origins/destinations) and request higher standard levels of services in terms of reliability, flexibility, timely information and safe handling of goods. Many of these customers do not benefit from direct rail connections to the networks. Considering the need for an efficient road interface to allow door to door services and to manage varying and sometimes rather small volumes over time, a plan shall be prepared including collecting points as part of the supply chain analysis. The plan could include a review of the existing and future physical capacity and organizations at terminals, stations and along the line, and formulate recommendations, including assessing areas for potential private sector participation in developing intermodal terminals.

As noted above for Component 4, the improvements in logistics organization and existence and operation of the newly constructed railway may have potential local environmental effects. It is important to carefully consider various aspects, including waste generation, air and water pollution, impact by engineering networks, etc. during preparation of recommendations for potential construction of terminals and stations along the railway. The TOR for preparation of the plan and recommendations mentioned under Component 5 will have to address this important aspect.

Component 6. Implementation support (estimated total cost US\$0.3 million, which will be financed by IBRD): This component will finance implementation support to UTY and UZE. Activities under this component include overall project management, procurement, financial management, engineering support, and supervision of compliance with environmental and social safeguards. No physical works and environmental impacts are involved.

Scope of the EMF and the EIA

The Environmental Impact Assessment (EIA) for construction of the railway line and the tunnel was prepared by the Design Institute Boshtransloiha. Consistent with Uzbekistan law, first a preliminary (scoping) EIA was prepared and reviewed by the State Expert Review, which specified additional detailed studies required⁸. The Bank also reviewed this

⁸Executive Summary of the EIA and Recommendations of the State Expert Review are contained in Annex 1.

preliminary EIA and provided comments. The EIA was updated taking into account comments from both the State Expert Review and the Bank. One significant potential issue that was identified was radioactive hazard during the tunnel construction in areas known for uranium mining. However, the sampling carried out to date indicates there is no excess of radiation levels in the main tunnel and shafts. A targeted Action Plan for management of the radioactivity risk, including independent monitoring and verification of radioactivity levels in the working zone and designation of sites for disposal of any radioactive materials, has been prepared and is being implemented by the tunnel contractor under the supervision of the engineering consultants. Also the final EIA includes the action plans for: (a) management of radioactivity risk, (b) mitigation of negative environmental impacts in sensitive areas (i.e. potential pollution of rivers and streams, water protection zones), (c) management of borrow pits and sites for waste material, and (d) management of geological risks and emergency situations. The final EIA was approved by the Uzbekistan authorities, but it was determined that some additional information and mitigation measures were required to meet the Bank's requirements as set out in OP 4.01. Rather than revising than already approved EIA, this additional information has been incorporated into the Environmental Management Framework (EMF) for the project, as described below.

The EMF covers all other components and activities in the project, including the railway line and tunnel as well as electrification/signaling, construction of power transmission line, operation of borrow pits, river channeling works, bridges and overpasses, etc.). All of the physical works (under Components 2 and 3) will require preparation of stand-alone EIAs under Uzbekistan law, and the EMF provides further guidance for ensuring that these EIAs and site-specific EMPs also fulfill the requirements of OP 4.01.

For projects of "A" category (significant/large-scale environmental impacts) preparation of site-specific EMP takes into account: (i) the main types, extent, location, duration and reversibility of environmental impact, expected as a result of implementation of project activities; (ii) measures of response: prevention, minimization, mitigation, reduction or compensation of negative impacts; (iii) rules effective and timely response; and (iv) mechanisms for implementation of such rules, particularly in human resources, financial resources, responsibilities and competence. Annex 3 (see also Annex C, OP 4.01, format and content) contains the standard table format of EMP, meeting the requirements of the World Bank.

The EMF also serves as a supplemental EIA for the railway line and tunnel, as noted aboveto meet the requirements for a Category A project under OP 4.01. It reiterates the important information from the existing EIA, including baseline data and potential impacts and mitigation measures for all project components, and also provides the additional information and analysis needed (e.g. details on methodology, Mitigation and Monitoring Plans, capacity of the implementing institutions, etc.). Therefore, the EMF is proposed to serve as the primary environmental safeguards instrument for the project, to be disclosed and provided for public consultation prior to Appraisal.

An Environmental Audit of works carried out previously was undertaken and its findings are included in this final version of the EMF. Previous visits to ongoing construction sites by the team's environmental specialist indicated that there were no significant issues that would require a suspension of the works, but did identify some needed improvements. The Environmental Audit reviewed progress in these areas and provided specific recommendations for remedial measures. An Environmental Action Plan based on these recommendations was prepared, agreed and included in the EMF. Environmental Audit with Environmental Action Plan is contained in Annex 4.

3. **Regulatory framework of the Republic of Uzbekistan and the World Bank's policy**

Compliance with national environmental requirements and good international practices. Requirements for implementation of industrial environmental control and local monitoring of individual environmental components are contained in legislative and regulatory acts governing their protection. Currently, all works on construction of all facilities (bridges, areas of alignment of riverbeds, pits, etc.) are carried out with observance of measures on environmental protection and on the basis of the following regulatory documents, norms and standards.

The project must meet the applicable requirements of legislation of the Republic of Uzbekistan and operational policies of the World Bank, within the scope of impact under this project. In case of significant discrepancies between these two regulatory frameworks, for execution will be taken requirements of the most restrictive one of two regulatory regimes.

At present, railway construction works along the alignment are being implemented by construction units of the UTY and is reported to be in compliance with the national construction standards. The compliance of the contractors is being monitored by key regulatory agencies (environmental, health and safety) on a regular basis. The Environmental Audit mentioned above will indicate whether any additional precautions or actions are required to ensure that construction also complies with the EMF.

The comparative review of the requirements of the regulatory environment of Uzbekistan and Environmental Health and Safety (EHS)Guidelines of the World Bank Group regarding environmental health standards in construction/infrastructure was undertaken. The results of this review suggest that environmental health and safety requirements of those two systems are equivalent. The Environmental Audit will check whether the completed and on-going works are in compliance with these requirements. (Environmental, health and safety regulatory framework of Uzbekistan is contained in Annex 2).

Requirements of the World Bank

World Bank OP/BP 4.01 Environmental Assessment is triggered. The activities under the project are large-scale and involve various types of works and activities: operation of borrow pits, large-scale earthworks, rock blasting, construction of the tunnel, access roads, power transmission lines, etc. All the above activities require full Environmental Impact Assessment (EIA). Also, technical assistance under the project will have to be reviewed from the perspective of potential environmental impacts that may take place as a result of implementation of plans/strategies/recommendations developed within the framework of the TA.

Because of the significance of its impact, the project is rated Environmental Category A as per World Bank environment policy OP/BP 4.01 Environmental Assessment. This is

consistent with the requirement under national law. According to the List of activities under which the state ecological examination is conducted (Appendix N $_{2}$ 2 to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan of December 31, 2001 N $_{2}$ 491) "About State Ecological Expertise", railways of national significance refer to high environmental risk (the 1st category of impact on environment), for which the full-scale EIA should be carried out.

World Bank OP 4.12, Involuntary Resettlement. This policy is triggered as the project will require The preliminary assessment of the scope of land acquisition and resettlement has been completed by UTY. The available data suggests that approximately 270 households including farms plots and a few commercial entities are affected. The majority of project affected people are ethnic Uzbeks (90 percent) followed by ethnic Tajiks (8 percent) and Uygurs (2 percent). The demographics of the region are generally mirroring those of above. The average households consist of 5 people. The majority of those employed are currently benefiting from the nearby factory, ore mining and textile facilities. UTY is conducting a socio-economic study to understand impacts on the project affected people and broader social impacts of the project, particularly on women and the most vulnerable. An RPF has been prepared for the project, as well as a RAP covering both land acquisition that has already been carried out and future land acquisition that is already known. As some gaps have been identified between the resettlement implemented to date and the requirements of OP 4.12, an action plan for remedial measures has been prepared and will be included in the RAP. It is possible that the need for a small amount of additional land acquisition will be identified based on detailed designs. In this case, a separate RAP will be prepared at that time, based on the RPF. Based on the above, OP 4.12 is also triggered.

World Bank OP 4.11 Physical cultural resources. Implementation of the project takes placein part on the territory of ancient settlement Chilhujra of VI century BC – IV century AD, which is, according to scientific conclusion of the research staff of the State Hermitage Museum (St. Petersburg, Russia), of great historical importance and value for archaeology, history and culture of Ferghana valley, Uzbekistan and the entire Central Asian region. The works on the alignment in the fall of 2013 resulted in damage to the site⁹. The Bank required from the UTY to stop the works to prevent further damage and prepare the Action Plan for Physical Cultural Resources. Such Action Plan was prepared as a separate document and consulted with authorities responsible for protection of historic and cultural heritage. The site will be surveyed by specialists in archaeology according to legislation of Uzbekistan. If the survey indicates the need for any additional protection measures, these will be put in place before any additional works are carried out that could impact the site. The Action Plan (Annex 3 to EMF) indicates that the alignment should avoid historic and cultural sites as much as possible.

Applicability of OP 7.50 Projects on International Waterways: The issue of applicability of OP 7.50 has been extensively discussed with the Uzbekistan Railway Company (UTY) in event of (i) water abstraction from a tributary of an international waterway being planned and/or occurred, and (ii) pollution or other downstream impacts on a tributary of an international waterway due to river channelization/straightening associated with the project activities. The UTY formally confirmed that no abstraction of water from the Akhangaran and Chadak Rivers (tributaries of Syrdarya River that has a status of international waterway) is planned or necessary. The sources of water supply for all proposed construction activities of the Project are reported to be existing wells (stations

⁹The alignment makes a cut through the central section of the historic site. The dimensions of the cut are 50 m (width) x 120 m (length). Approximately 10 % of the historic area was damaged (see picture on p. 58).

Sardala, Razezd 2, Razezd 3 and Razezd 4), water tanks (stations Razezd 1 and Temirjulobod), and existing piped town water supply (stations Angren, Uglesborochnaja and Pap). As outlined in this EMF, precautions will be taken to ensure that there is no impact on the rivers from sewage effluent, erosion from works, or runoff from material stockpiles or machinery. In addition, it has been confirmed that construction of bridges, embankments, and channelization/straightening activities in the area of Akhangaranriverdoes not trigger OP 7.50.Therefore, the policy on international waterways OP7.50 is not triggered.

Institutional framework and implementation capacity

The State joint-stock railway company - SJSRC "UzbekistonTemirYullari" (UTY) includes six regional railway junctions with rights of legal entity. The physical assets of the UTY include stations, tracks, signaling and communication, energy supply, locomotive and car depots, points of technical and commercial inspection of cars and other associated infrastructure.

The Design Institute OJSC "Boshtransloyiha" is the leading institute for preparation of prefeasibility, feasibility studies and design for railways in Uzbekistan. "Boshtransloyiha" coordinated preparation of these studies, including the EIA for this project. The EIA included the substantive independent inputs/views and conclusions of the specialists from 18 environmental, academic research, nature conservation institutions, agencies and organizations.

The staff schedule of the UTY has the Department that is in charge of public relations. This Department is engaged in popularization and coverage of the latest news, adopted investment projects in the field of railway sector, and activities. There is a corporate website covering the latest updated events within the company's programs.

The State Committee of the Republic of Uzbekistan on Architecture and Construction in the context of this project is entrusted to provide expert support, the state expertise of project documentation and appropriate state architectural and construction supervision of the quality of construction works.

The State Committee of the Republic of Uzbekistan on Nature Protection (hereinafter — the State Nature Committee of the Republic of Uzbekistan) is specially authorized supradepartmental and coordinating authority conducting state control and inter-sectoral management in the field of nature protection, use and reproduction of natural resources.

The information campaign in order to raise awareness among the local population was launched by the UTY before the project start.

Project Implementation Unit (PIU) is selected on competitive basis by the company SJSRC "UzbekistonTemirYullari" on the grounds of Regulation on Project Implementation Unit "Construction of electrified railway line Pap - Angren", internal order "About establishment of PIUPap - Angren" as the lead Agency for implementation of the project. The PIU will cooperate with OJSC "Boshtransloyiha", the State Committee of the Republic of Uzbekistan on Architecture and Construction and each of the involved ministries and agencies to ensure effective and continuous exchange of information with all project partners. The PIU will ensure coordination of all project activities, procurement of works, goods and consulting services for project implementation, control and monitoring activities within the

project, and routine reporting to authorized services.

The PIU will be responsible for coordination of preparing EIAs for other project components. PIU will sign contracts with specialized agencies (such as Uzgiprozem, Giproleskhoz and others) for preparation of mitigation measures/EMPs for other project components. These specialized agencies will be responsible for approval of all these EMPs in the State Nature Committee of the Republic of Uzbekistan. Environmental engineer (consultant) will be hired by PIU will ensure that all these mitigation measures/EMPs are acceptable to the WB.The environmental engineer will supervise environmental aspects of project implementation in coordination with other stakeholders (such as design engineering companies, contractors and engineerson supervision of construction and etc.).

There is Sanitary-Epidemiological Service (SES) within the organizational structure of UTY. The scope of responsibilities of SES includes, among other tasks, radiological and sanitary monitoring of design, construction and reconstruction of railway facilities, control of working environment conditions, workers' safety and sanitary conditions of construction camps, drinking and general use water quality.

In the context of this project the SES of UTY will be responsible for:

- radiological monitoring of the sites of works, determining the level of radiological risk for workers and establishing time limits for working day, if necessary;
- ensuring all sites for location of construction camps meet sanitary standards and all safe drinking water supply requirements and sanitary conditions for worker's catering are met;
- dissemination of information on health aspects during construction (communicable diseases, organization of meals in field conditions, influenza and acute respiratory disease, scabies, malaria);
- periodic guidance of personnel on the issues of workers' safety (jointly with Department of Workers' Safety of UTY);
- supply of individual protection gear for workers protective clothing, hard casks, safety belts, gloves, etc.

4. Status of works, potential environmental impacts and proposed mitigation measures

This section contains the information on the status of works, potential environmental impacts and mitigation measures for investment Components 1, 2, and 3, and is complimentary to the EIA.

Current status of works. As of July 2014, out of proposed 123 kilometers of the railway, design specifications and estimates for the segment of 92.6 km were developed and presented to contractors. Construction is conducted on both sides of the tunnel (from crossing station Angren - Pap). As of today, the work on raising the ground level was accomplished at the total length of 60 km, and construction of the new railway was completed at the length of 55 km. This year, the construction of 127 culvert facilities was scheduled, with total length of 1328 meters, and building and installation works on erection of 12 railway bridges are being carried out. Overall, works on 147 culvert facilities and on 5 bridges (total length of the bridges 336 m) were accomplished. Under the project, on 19.1 km of rail tunnel work employees of Chinese companies on 4 construction sites, with appropriate infrastructure (communications, water supply, electricity). In the area of the tunnel (Western and Eastern portal) at the distance of 14 km from the highway, 37 km

of power transmission lines were built and 69 transmission towers installed. Construction began on the main shaft of the tunnel (Western and Eastern portal) and of three additional (technological) shafts. The total length of tunneling and technological shafts as of June 2014 was 5221 meters (from the Western portal of the main tunnel the deepening reached 1060 meters, from the Eastern portal 940 meters, and in the 1st face = 1257m, 2nd = 974m, 3rd = 990 m. From May 1st 2014 finishing works began in the main tunnel. Construction of the main shaft of the tunnel of 7 km and works on drilling of 8km of the raise were accomplished.

Potential environmental impacts and proposed mitigation measures

This section contains the information supplemental to the EIA for the railway line and tunnel: as noted above, some aspects have been only partially covered in the EIA and required additional analysis and/or recommendations.

For most construction and rehabilitation works under the proposed project, adverse impacts of the proposed activities on the environment would take place during the construction stage, and they include large-scale earthworks (including blasting), soil erosion, generation of noise, air, water, and soil pollution and generation of waste.

The purpose of mitigation is to reduce and mitigate any potential adverse environmental impacts. There are often different alternatives to mitigate negative effects. Selecting mitigation methods to be used should therefore be a collaborative process between the engineering and environmental specialists. The methods used should be economically feasible and efficient.

a. Impact on surface water (rivers, streams) and ground water

There will be no abstraction of water from the Akhangaran and Chadak Rivers (tributaries of Syrdarya River that has a status of international waterway). The sources of water supply for all proposed construction activities of the Project will be:(1) existing wells (stations Sardala, Razezd 2, Razezd 3 and Razezd 4), (2) water tanks (stations Razezd 1 and Temirjulobod), and (3) existing piped town water supply (stations Angren, Uglesborochnaja and Pap).

The project has the potential to create some short-term and minor adverse impacts on water quality including (i) an increase in silt loads at culverts and bridge sites; (ii) construction materials such as gravel, sand, and fill being washed out into local streams and rivers during rain; (iii) hydro-carbon leakage and/or spills at storage and mixing plant locations; and, (iv) discharge of waste water and sewage from work camps to local streams and rivers.

In addition to a number of the items outlined above employed to mitigate soil erosion and effects on slope stability that will also mitigate adverse effects on water quality, the following measures will be included in the engineering design and EMP:

• Interference with natural water flow in rivers, water courses or streams within or adjacent to work sites, and also abstraction from, and pollution of, water resources at the project sites will be prohibited;

- Water courses, rivers, streams, drains, canals and ditches within and adjacent to project works sites will be protected from pollution, silting, flooding or erosion as a result of project activities;
- Streams, rivers and watercourses (including drains) within and adjacent to the work sites will be kept free from debris and any material or waste generated during project works;
- Sediment controls such as silt fences, coffer dams and silt barriers and other devices will be included in the engineering design to prevent both siltation and silt migration during project activities in the vicinity of rivers and streams.
- Discharge of sediment laden construction water or material (including dredged spoil) directly into surface waters will not be permitted. All such construction water will be discharged to settling ponds or tanks prior to final discharge;
- Water used for dust suppression purposes will be discharged to specially constructed settlement tanks allowing for sedimentation of particulates. After settlement the water may be re-used for dust suppression and rinsing of vehicles and equipment;
- Hydro-carbons, petroleum products to be used in bitumen mixes, and other chemicals will be stored in secure and impermeable containers or tanks located away from surface waters, the storage areas will require a concrete base or other forms of containment that will allow any spills to be contained and immediately cleaned up. Any contaminated soil will be handled according to CEP standards;
- Spoil and material stock piles will not be located near waterways, rivers or streams;
- All storm drainage will be adequately contoured, sized, and lined where necessary;
- Construction and work camps will be equipped with sanitary latrines that do not pollute surface waters. A waste management plan, covering all liquid and solid waste, will be prepared by the contractor and submitted to the PIG;
- Discharge or deposit any material or waste into any waters except without the approval from the relevant regulatory authorities will not be permitted; and
- All water, waste-water and other liquids used or generated in execution of project works and activities will be collected and disposed in an approved manner in an approved location and will not cause either pollution or nuisance.

The Design Institute "Boshtransloyiha" is *responsible* for development of the action plan, and the responsibility for compliance rests upon the project initiator (Client).

Monitoring of compliance with the plan and construction in this area will be carried out by administrations of the State Committee on Nature Protection, the State Committee on Geology, and the State Biological Control.

b. Bridges construction and river bed straightening

River protection measures (during construction of bridges, straightening of river beds, and other works with in-stream footprint or affecting water protection zone) which are required by construction standards/norms, sanitary/health and environmental regulations are expected to mitigate negative impacts on river ecosystems. Additional survey, as specified in Section I (Flora and fauna) below, will be launched and site-specific EMPs prepared. These EMPs will identify protection measures, activities that are prohibited, and site-specific parameters of the river which should be maintained to ensure environmental conditions of specific site/area are acceptable.

Stand-alone EIAs and EMPs have to be prepared for bridges and river bed straightening areas. The EMPs should require the contractors to:

- keep exposed working surfaces to a minimum;
- avoid disposal of excavated material in the river;
- regularly maintain slope protection structures and gabion embankments;
- optimally place silt fences and sediment traps to prevent sediment from reaching the river;
- store, handle and dispose of construction site chemicals such as oils, gasoline, degreasers, antifreeze, concrete and asphalt products, sealers, paints, herbicides, insecticides, and wash water associated with these products to minimize their entry into runoff
- arrange designated fueling areas and equipment washing areas
- complete works in the riverbed within the shortest possible time;
- clear the area of construction from construction waste and temporary structures;
- re-cultivate the affected area.

c. Electromagnetic rays and potential radioactive contamination

Electromagnetic rays

Electrical rail transport is a source of strong electromagnetic fields (EMF) of large extent. Tracks of electrified railways, as part of an electric circuit, are the source of ground currents (circulating currents) in the land of large extent. Further, these currents are concentrated on materials with higher conductivity than the land - metal surface of underground pipelines, plumbing systems, communication cables, etc. Ground currents can make a significant contribution to the magnetic field of environment. Also, power transmission lines generate strong EMF and can be harmful to human health and environment. Based on the above, the environmental impacts of the EMF generated by operation of the power transmission lines will be carefully assessed during the EIA of the transmission line and a designated EMP prepared.

Sources of electromagnetic fields and electromagnetic rays (EMR), generally, are the source of multiple electromagnetic impact on human, wild and cultivated plants, animals, insects and soil flora in area of their influence. Further, they occupy areas with large territory (for example, overhead transmission lines, the contact network of electric transport).

Depending on relation of exposed to EMF person to radiation source, two types of impacts are distinguished: professional (impact on staff) and non-professional (impact on population). The professional impact is characterized by combination of general and local irradiation; the non-professional by general irradiation only.

The main sources of EMF and EMRduring railway construction and operation will be electrical installations of temporary power supply system, cables and wires, some technological operations (welding, electrical heating up of concrete, etc.), mobile communication equipment, power transmission for operating railroad. With efficient protection, the levels of EMF pressure at workspace will not exceed the standard/acceptable levels.

The impact on population of EMF and EMR sources associated of construction works and railway operation is low or non-existent due to distant location of the working sites from residential areas.

Measures to mitigate impact of the EMF and EMR sources

Although the maximum permissible levels of EMF and EMR are not expected to be exceeded, in order to minimize and mitigate the impact of electric railway equipment on the environment and human health, the following mitigation measures will be put in place:

- use vehicles, machinery and equipment with low levels of electromagnetic rays, packaged deliveries, with certificates of conformity;
- move MF sources away from places of human residence;
- structural shielding of EF and MF sources;
- fencing of zones with MF levels exceeding Maximum Acceptable Level (MAL);
- grounding of support structures and devices;
- maintenance of HV (high voltage) line protective zone;
- grounding of pneumatic-tired machines and machinery when located in roadside clear zone;
- use, whenever possible, of cables and isolated current-carrying cables to avoid the contact of fauna representatives with electric current.

Radioactive impact

The norms of radiation safety are defined in SanPiN N $ext{0193-06}$. The acceptable exposure dose rate of gamma radiation is up to 30 μ R/hr above the existing background radiation. The existing radiation background on the route (on the surface) is up to 25 μ R/hr, the concentration of radon and its decay products is up to 70 mBq/m²sec.

Given that the tunnel area is characterized by potentially higher levels of radioactivity, measures for radioactivity control and, if necessary, targeted mitigation measures will be implemented by the Contractor and Supervision Engineer.

Measures to prevent radioactive impact:

(According to the letter from the State Committee on Geology of the Republic of Uzbekistan № 06-1709 of 17.09.2013)

- to measure on everyday basis the exposure dose rate of gamma radiation (EDR);
- to measure every 100 meters of tunneling the concentration of radon and its decay products in the air of working zone;
- in case excessive levels of radioactivity are detected, the degree of individual worker's radiological safety will be assessed;
- to organize when tunneling a measurement of EDR and concentrations of radon in the air by technician-documenter. If exceeded parameters are detected, then to inform the regional SES and develop an action plan for normalization of radioactive situation.
- to provide an effective ventilation system, which is described and agreed with an international expert in the detailed design of the tunnel construction. In the tunnel currently was installed the temporary ventilation, the permanent will be installed according to the design documentation. Documentation on ventilation system in

tunnels is under negotiation. The ventilation system will be installed in compliance with international standards under coordination of Consultants and authorized bodies of the Republic of Uzbekistan; at possible opening of radioactive rocks, there will be organized the collection and transport of radioactive waste to the landfill for radioactive waste at OJSC "Navoi MMP" in compliance with "Regulation on treatment and storage of radioactive waste in the Republic of Uzbekistan" №61 dated 19 April, 2013, Sanitary Rules of Radioactive Waste Management 0251-08 and Sanitary norms and rules of radiation safety 0029-94;

- action plan was developed in emergency cases for the whole project, as well as for the construction of the tunnel(Annex5);
- the insurance of personnel, facility, and third parties is provided from emergency situations during construction of the tunnel in case of their occurrence, which includes payments to victims, etc.

The responsibility for ensuring radiation safety rests upon the Client (initiator of the project) at construction of the railway line. The responsibility for radiation control within the tunnel's zone rests upon the Contractor of the tunnel construction. The Ministry for emergency situations also conducts the control and monitoring of the radiation situation. On June 10th, 2014 there was carried out an inspection, which included analysis of radiation, and checking the maintenance level of storages for explosives. The Contractor (CRTG) had signed a contract with headquarters of the militarized mine-rescue unit of the State Inspection "Sanoatgeokontehnazorat" with a view to carry out trainings on preparation of supporting rescue teams in mountain areas including the personnel of Contractors, and to increase the level of preparedness during the conduct of rescue works at possible landslides and emergencies.

Control and monitoring over the level of radiation environment are performed by the State Sanitary and Epidemiologic Control, the State Nature Committee, the State Geology Committee, as well as by invited international expert in the field of tunneling. Monitoring and control over the level of radiation are performed by Contractors (CRTG) everyday by special device including EDR¹⁰, and during inspection trips are reconciled with Consultants on supervision and control over construction (DBI). Every three months the Central Sanitary and Epidemiological Service (CSES) conducts inspection and verification of radiation level and purity of drinking and technical water.

d. Hazardous geological processes

Between the 5th and 16th km of the projected railway there are large old and recent landslides, which pose a danger during the construction and operation of the railway. Six hazardous sections were detected with size more than 100 thousand cubic meters each. On section of Naugarzan landslide there is the possibility of deformation in kaolin clays. The slopes along the road have sections prone to development landslide processes. There are 29 scree and avalanche- and landslide-prone sections with size less than 100 thousand cubic meters each. On other sections of the railway line, in places of thin loam and fine-grained soils, at spot facing of mountain slopes it is possible the formation of surface landslides of small volume. On the construction sites of deep and extensive cuttings there may be an offset relatively to small landslides and the collapse of loose detritus material fromsteep laid slopes.

¹⁰Monitor of radiation (deviceofMKS-05 model) is used to monitor the radiation.

Measures to minimize the impact of hazardous geological processes: In accordance with recommendations of the State Service of Tracking it is scheduled to move the route away from sections of landslide danger on safe distance. The project also provides construction of buttress at the grassroots slope and implementation of slope stabilization/reclamation works with planting trees and shrubs, as well as planting windbreaks. The project provides carrying out of monitoring observations over engineering-geological processes and the action plan for alerting the population and elimination of consequences. The plan of action for emergency situations was developed for the entire line.

To prevent and reduce the impact of construction and operation on geological environment it is planned to take the following measures package.

At construction period:

- surface stream flow control with due regard to recovery of the natural one;
- implementation of works on lowering the groundwater level in order to prevent their further rise (drainage works, regulation of natural runoff with culvert devices in places of surface water concentration;
- organization of open or closed drainage in places where the moisture is concentrated;
- placement of the route's infrastructure facilities on minimum required spaces with compliance to the norms of built-up density, the laying of communications in common corridor;
- placement of engineering structures, which may result contamination of surface soil and vegetation layer, on platforms with firm cover, framed with onboard stone;
- prevention of oil spills and generation of construction waste dumps;
- consistent re-cultivation of disturbed lands as the work advances;
- when carrying out construction works in warm part of the year, on slopes with steepness of 2 and more degrees measures should be taken to prevent washout during construction and after its completion;
- maximum preservation of natural water flow –arrangement of culverts;
- to stabilize the slopes, decks can be used with stacked on top wire mesh; after laying the mesh it is fixed with pegs at several points so that the mesh is held in place;
- surface stream flow control with due regard to recovery of the natural one;
- carrying out of works on disposition of the water flow from the catchment and drainage of rain waters out of railway bed and ditches of temporary roads;
- planning of watershed with retention of their vegetation, increasing the roughness of thalwegs of existing gullies by shrubs and ground rollers, concrete trays with ribs of roughness can be used for catchment of water;
- in conditions of extremely high steepness of slopes for erosion control to arrange the berme (shelves) on the slopes.

During the operation one of the priority nature protection measures is the creation of monitoring network for observing the active demonstrations of exogenous geological processes along the whole length of the railway.

Monitoring over the status of earthen embankments, bridges and adjacent areas should be included into the measures on implementation of scheduled preventive repair works.

Along with establishment of operational monitoring network and conducting observations in it, there should be provided activities aimed at preventing or minimizing the possible anthropogenic impact on geological environment. First of all:

- carrying out of preventive examinations of subsurface parts of structures and communications on auxiliary facilities of the railway with a view to timely detect the leakage of waste water and fuel.
- carrying out of timely repair works on embankment and in area of river crossings;
- consistent re-cultivation of disturbed lands as the work advances.

Responsibility for development of the project on vegetative reclamation works for prevention of erosion processes and compensation for damage to biological resources rests upon Giproleshoz (State Design Institute of Forest Management), and for the program of conducting the monitoring observations of engineering and geological processes within the period of railway line operation rests upon the Client (initiator of the project) together with the State Service for Monitoring of Dangerous Geological processes, and for the action plan on relieving of consequences of hazardous geological processes rests upon the Client. Before putting the railway lines into operation, SJSRC UTY in conjunction with the Institute Boshtransloyiha and the State Committee on Nature Protection schedules to develop the action plan on relieving the consequences of dangerous engineering and geological processes. The main executor is SJSRC UTY.

Monitoring and tracing of geological risks are rested upon the State Committee of the Republic of Uzbekistan on Geology and Mineral Resources, and the State Service of the Republic of Uzbekistan on Monitoring of Dangerous Geological Processes.

e. Emergency situations

The contractor is responsible for preparation of an emergency response plan which covers containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel).

This emergency response plan should include the organization structure, duties and responsibilities and work system, emergency response procedures and rules. The coordination team shall be responsible for coordinating the activities of emergency rescue and treatment of such accidents. Duties and responsibilities in the emergency response plan shall mainly include: researching and developing safety measures and policies of the respective municipality regarding road transportation of hazardous chemicals, setting up registration files for vehicle owners and vehicles and drivers who are engaged in transportation of hazardous chemicals, organizing safety inspections to the service providers who are engaged in road transportation of hazardous chemicals periodically and holding meetings among the coordination team to report accident information, organizing professional training and emergency response rehearsals for managers of transportation service providers, drivers, supercargoes, loading and unloading workers who are engaged in transportation of hazardous chemicals, organizing public education activities to promote the safety awareness of citizens and practitioners, preparing statistics and reports about accidents of road transportation of hazardous chemicals.¹¹

¹¹It is recommended that the local governments at all levels along the proposed railway alignment should

The plan will be submitted to UTY for approval. Implementation of the plan will be monitored by UTY. Any emergencies, and how they were handled, will be reported in monthly progress reports.

The emergency response actions shall be carried out in accordance with the following procedure and principles:

- Anybody who notices any such accident shall give an immediate report via the roadside emergency telephone or other communication devices to the Hazardous Chemical Road Transportation Accident Coordination Team.
- The Coordination Team shall immediately notify the nearest road traffic police who should deal with the accident and control the accident site once an accident report is received and, In the meanwhile, the nearest local fire department shall be notified to send fire engines and firemen to carry out emergency rescue on site.
- If the hazardous goods are in solid state, such goods may be cleaned and properly treated and records shall be kept of such accident.
- In case of any gaseous and toxic hazardous goods, the firemen shall handle them in gas masks; where spillage of hazardous chemicals becomes inevitable, an immediate notice shall be given to the environmental protection authority and the public security authority and, if necessary, access to the contaminated area shall be banned to avoid possible casualties due to intoxication.
- If the hazardous chemicals are in liquid state and have entered the public water system, an immediate report shall be sent to the environmental protection authority. Upon receipt of such report, the environmental protection authority shall immediately send its environmental protection experts and monitoring staff to the accident site to conduct monitoring and analysis and assist the relevant authorities to retrieve the containers out of water in a timely manner.

In the process of operation of the railway bridge it is not excluded the possibility of accidents. Frequency of emergency situations at transportations by rail was estimated to be about 10⁻⁴. Part of accidents may be accompanied by contamination of soil and riverbeds by transported goods, fuels and lubricants. After tunnel construction, the Contractor CRTG will have to prepare final documents for operation of the tunnel, where will be described the procedures of prevention of emergency situations in the tunnel and the evacuation plan within the operation period.

f. Borrow pits, stockpiling of material and slope stability

Waste from surplus stock of materials at tunnel excavation, borrow pits, drilling and blasting works, construction facilities has significant risk to the environment.

Borrow pits will be operated by the Contractors only at designated locations and for which both operational and environmental permits have been obtained. No borrow pit will be operated without a site specific EMP that will contain a plan for its closure, remediation and re-cultivation that will be approved by the local environmental authorities (as required under Uzbek regulations) as well as the supervising engineer (who will ensure that

highlight the issues concerning emergency responses to transportation risks in the section of Akhangaran Reservoire, Akhangaran River, Chadak river, Almalyk Ore Mining Works under this Project into the local emergency response plans for accidents of road transportation of hazardous substances.

international good practice is followed).

The Design Engineers have defined a number of existing and proposed borrow pits for all sections of the alignment. These are shown in table 1. The existing legal borrow pits have already received approval from the Rayon Hokimiyat and all other responsible institutions including environmental approvals. They are available for use by any contractor depending on the contractor's precise requirements. The contractor does not normally own or have an interest in the ownership of a borrow pit. The contractor merely enters into a contract with the owner/operator of the borrow pit to buy specified amounts to an agreed specification. The contractor would be responsible for maintaining any public and private access roads between the borrow pit and the construction site.

| No. | Name | Material | Status | Mileage, km / Distance to alignment |
|-----|------------|--------------|----------|---|
| 1 | Borrow pit | Crushed soil | Existing | Km 74 |
| 2 | Borrow pit | Pebble stone | Existing | Km 81 |
| 3 | Borrow pit | Pebble stone | Existing | Km 90 |
| 4 | Borrow pit | Pebble stone | Existing | Km 98 |

Table 1: Borrow Pits

To mitigate the impacts from borrow pit sites and borrow pits, it is recommended that in addition to the preparation of the materials and spoil plan, that bid and contract documents specify that (i) borrow areas will be located outside the right-of-way (use of suitable material arising from necessary excavation for the permanent works within the ROW being excluded from this restriction); (ii) pit restoration will follow the completion of works in full compliance all applicable standards and specifications; (iii) arrangements for opening and using material borrow pits will contain enforceable provisions; (iv) the excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the project supervision consultant(PSC) will be required before final acceptance and payment under the terms of contracts;(v) topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the PSC; and (vi) additional borrow pits will not be opened without the restoration of those areas no longer in use.

Currently, the draft Environmental Impact Statement on construction of borrow pits and spoil grounds is developed, as well as the project of re-cultivation of lands disturbed during the construction of the railway line, borrow pits, and spoil grounds.

The responsibility for development of projects rests upon the Design Institute Boshtransloyiha and Uzgiprozem (State Design Institute of Uzbekistan on Land Management). Responsibility for violation and unauthorized movement of approved soil deposit areas rests upon the Contractor.

Monitoring of compliance with measures is conducted by the State Nature Committee, CSES, and local authorities.

In order to reduce impacts associated with quarry activities and borrow pits, contract documents will specify only licensed quarrying operations to be used as material sources. If

licensed quarries are not available the contractors will be responsible for setting up dedicated crusher plants at quarry sites approved by the PIG and CEP. Further, for all borrow sites, contractors will ensure that they acquire appropriate environmental permits from CEP before sourcing the material.

The contractors will be required to prepare a plan to identify the sources of material and that will be used for the embankments. The plan will be agreed with the engineer of the construction works supervisor and submitted to PIG, which will ensure that the plan is implemented. The materials and spoil plan should show the location of any borrow pits to be used and the measures to be taken to rehabilitate these pits upon finalization of the project. PIG will approve and monitor implementation of the plan.

Prior to the start of the operation, the contractor should also prepare a borrow area operation plan indicating the boundaries of the borrow area, access roads, proposed area for extraction of material, and geological cross section.

No quarry shall be located within 500m of any urban area, protected area or sensitive receptor. In addition, Contractors should ensure that quarries and crusher plants are:

- located at least 500 meters from urban areas to prevent noise and dust impacts, and
- located outside of agricultural land.

Impacts will be mitigated by:

- All required materials will be sourced in strict accordance with Government guidelines, project provisions, and the EMP;
- Priority will be given to location of material stock-piles, borrow pits and construction camps on unused land and non-agricultural land. All land will be rehabilitated to its original or better condition upon completion of the project works;
- The side slopes of cuttings and embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to prevent erosion;
- To prevent soil erosion gabion baskets for river bank protection should be included in the engineering design;
- For embankments greater than 6 m, stepped embankments will be used;
- Material that is susceptible to erosion will be replaced by adequate material around bridges and culverts;
- Random and uncontrolled deposition of excavated material will not be permitted. Suitable deposit sites will be designated (generally wide gently sloping areas located away from streams and rivers) at a maximum average spacing of approximately 1 km, and usually with a tipping zone from the road edge of not more than 10m width (unless a wider area clearly will not be detrimental), to minimize the area affected by depositing and requiring reinstatement;
- Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of preferably local grasses and shrubs; (ii) immediate re-vegetation

of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only feasible where there is regular rainfall or other natural water supply;

 Acquisition of all necessary permits and approvals for location of construction camps, quarry sites and sources of construction materials from CEP and local government agencies prior to any construction or erection of camps and extraction of material.

g. Earthworks and re-cultivation of affected areas

In the process of construction there will be performed 50.6 million m³ of earthworks, including 34.7 million m³ of drilling and blasting. During excavation of the tunnel there will be generated 1.8 million m³ of excavated rock materials. As quarries of ground for railroad embankments are mainly used soils excavated out of towering forms of relief, according to longitudinal path profile. To supply construction with lacking volumes of soil, there were projected soil banks along the route with total volume of 6.8 million m³. It is scheduled to build 46 km of access and the route-side motorways. There will be separate EIAs with EMPs for access roads.

Large-scale earthworks on construction of the embankment, bridges and associated infrastructure will require diligent supervision, especially regarding stabilization of the embankment, labor safety and works in the area of the liquid waste lagoon of the Almalyk ore mining works. Activities for land re-cultivation allow to save for later use 386 thousand m³ of fertile soils and introduce into agriculture 154.7 hectares of low-yielding lands.

| Indicators | Unit of measure | Size |
|---|-------------------------|-------|
| 1 | 2 | 3 |
| The volume of fertile soil layer removal | thousand m ³ | 386 |
| Introduction into agriculture of low-yielding lands | ha | 154.7 |
| Gardening and landscaping of annexes and technical | ha | 35 |
| buildings and dwelling houses | | |
| Re-cultivation of ground quarries | ha | 250 |
| Re-cultivation of spoil grounds | ha | 476 |

Main indicators for land re-cultivation are provided in Table 1.

Table 1. Main indicators for land re-cultivation

To minimize soil degradation processes, the construction works will adopt the following principles: (i) minimize area exposes to mechanical impact by optimizing of routes to supply equipment and construction materials, and (ii) limit vehicles and construction machineries.

Sowing of perennial grasses is recommended to make by grain-grass seeding machines.

For normal operation of the railway there will be no impact to vegetation cover.

To minimize human impact on vegetation cover during the construction of the railway the

following activities are proposed:

| Impact source | Measure to minimize adverse impact on | | |
|--|--|--|--|
| | vegetation cover | | |
| The burial of the vegetation cover under the | Selecting tracks that have minimal impact | | |
| dumps | on the natural vegetation communities | | |
| Mechanical disturbance of vegetation cover | Prohibition of passage of vehicles and other | | |
| due to vehicle traffic | machinery on random, unknown routes | | |
| | outside the given plot | | |
| Disturbance of surface and subsurface | Construction of sufficient number of | | |
| water flow, flooding or waterlogging of | culverts | | |
| areas along the embankment, generation of | | | |
| erosion processes | | | |
| Cluttering with household waste, wood | Provision of regular cleaning of adjacent to | | |
| waste, and other types of wastes | the project site areas, artificial and natural | | |
| | waterways from cluttering with | | |
| | construction, household and other waste | | |
| Chemical contamination of vegetation cover | Prevention of emergency situations | | |
| at spills of POL, chemicals and untreated | | | |
| sewage disposals | | | |
| Atmospheric contamination due to work of | Reducing emissions volume | | |
| engines of machines and machinery | | | |
| Fires | The right-of-way in places of contact with | | |
| | the plant arrays must be cleared from fallen | | |
| | trees, dead wood, forest residue and other | | |
| | combustible materials, and the border of | | |
| | the right-of-way must be separated with fire | | |
| | line plowing of width from 3 to 5 meters or | | |
| | with mineralized strip of width not less than | | |
| | 3 meters. | | |

Re-cultivation of the affected areas will be undertaken following the "Guide for design of re-cultivation activities at earth and rocky works in hydro-technical construction". Design provides for regulation on re-cultivation of the land plots intended for organization of the dump of soil from the pit of the main constructions and production base sites.

Implementation of re-cultivation activities is provided in two stages: the first stage – leveling of the ground/area for re-cultivation, and second – biological re-cultivation. Technical re-cultivation of all construction objects is carried out within a year after completion of construction. Design provides for complete removal and disposal of fertile soil on the special site for further use at re-cultivation. Temporary disposal places will be organized of the height up to 3m. Biological re-cultivation envisages carrying out of the complex of activities after technical re-cultivation with the purpose of restoration and improvement of soil structure, and restoration of their fertility. Works on planting of greens are also referred to this type of re-cultivation. For preservation of agrochemical properties of disposed fertile soil the surface of temporary disposal places should be sowed with perennial herbs.

The responsibility for development of projects rests upon the Design Institute

Boshtransloyiha and Uzgiprozem (State Design Institute of Uzbekistan on Land Management). Responsibility for violation and unauthorized movement of approved soil deposit areas rests upon the Contractor.

Monitoring of compliance with measures is conducted by the State Nature Committee, CSES, and local authorities.

h. Stability of liquid waste storage near Chadak

The railway line passes by the liquid waste lagoon of the Almalyk ore mining works. The alignment is at least 200 m away from the lagoon and the terrain is flat. No impact is expected from the works, however, planning of earthmoving works should be done taking into consideration the proximity of the lagoon (the borrow area for material for embankment should be located away from the lagoon to secure the stability of the embankment).

Measures to minimize the impact at waste disposal:

The certain places of waste disposal at construction were defined by the SES and improvement service (in this particular case by khokimiyats)¹², spoil grounds are used in embankments.

i. Waste management

The measures that are proposed to mitigate/restrict the impact of the construction waste generated during works are: re-use and recycle the materials and proper disposal of waste in accordance with permit. In general, waste generated during the whole construction period will be systematically collected, stored and disposed at the corresponding designated sites in accordance with regulatory requirements in the field of waste management in Uzbekistan.

The Contractor shall develop a program for waste management before works start as required under the Uzbek legislation on waste management.

Management of domestic and industrial waste is regulated by the Law of the Republic of Uzbekistan "on waste", SanPiN № 0297-14, SanPiN № 0127-02 and other governing documents.

The amount of generated solid and liquid wastes during construction work is preliminarily assessed to be 14.3 million cubic meters (stockpiles of unused soil). Forecast of production of solid and liquid waste after the project is 79.3 thousand cubic meters (industrial and domestic wastes), 60 tons/year (solid domestic waste), 1220 tons/year (losses at transportation of loads), 4.3 thousand cubic meters/year wastes of broken-stone and gravel ballast, 7930 t / year (solid sludge at treatment facilities).

All waste must be collected and temporarily stored in places of waste accumulation, equipped in accordance with the requirements of environmental and sanitary legislation,

¹²The order of Namangan oblast's Khokim (Governor) № 100 of 8 february2014 at construction of the tunnel.

and also the rules of fire safety for further transportation to specialized enterprises for use, disposal or processing.

Provided that the rules of collection and temporary storage, as well as accumulation regulations are complied with, generated on this territory waste, has almost no impact on contamination of soil, groundwater and surface water.

j. Air pollution

During the construction period, random emissions, mainly - dust and exhaust fumes, due to work of machinery, off-road vehicle movement, and loading-unloading activity are expected. Such pollution is insignificant and will be short-term.

The measures that are proposed to mitigate/restrict the impact on air quality are: not to use road and railroad construction machines as well as rail self-propelled machines with damaged engines; restriction on idling construction machines; road transportation vehicles should not be loaded with bulk materials beyond the safe-clearance and the materials should be covered during transportation; provide temporary watering for the storage areas for bulk materials and construction waste at dry and windy weather; disposal of waste, not subject of frequent loading-unloading activity, to be protected from the wind by covers; practice speed restrictions.

During the operation period, no significant air pollution is expected.

k. Noise

The construction site is a mixed source of noise, consisted of separate point or spatial sources of permanent and non-permanent noise, which varies both within a separate day time and during the individual periods of construction. The main sources of noise at the construction site are the work of construction equipment and trucks. When calculating the equivalent sound level it should be taken into account that the net operating time of construction equipment is in average 8 hours per day.

The Contractor shall develop and adopt effective measures both in terms of management and the technologies applied to minimize noise levels, particularly near settlements.

The main source of non-permanent noise during operation of the railway is the flow of railway transport (the passage of passenger and special trains). During operation, it is expected that the noise level will be within the permissible limits due to the rehabilitation works performed under this project. During operation, the level of the acoustic noise, caused by the traction supply system and its equipment, will meet the relevant requirements of the Uzbek legislation

Measures proposed to mitigate / reduce the impact of noise are organizational management measures, namely:

- to limit the impact of noise in residential areas in according with national legislation;
- construction activities will be coordinated with local residents, restriction on idling time for machines and equipment;
- servicing and regular maintenance of heavy construction vehicles;

- to travel on predetermined routes and approaches to strictly comply with the permissible speed when crossing settlements;
- limiting working hours in time zones designated by local authorities;
- in the case of acoustic emission in a specific direction to use acoustic barriers to break the line of impact from noise source to noise receiver.

I. Flora and fauna

The respective sections of the EIA were prepared in 2012 and the assessment included mainly desk review and limited field work (e.g. site visit to Akhangaran area was done in November 2012). The site visit included sampling, visual observation of the project area/river and collection of information from local fishermen. Issues on species migration, concentration and wintering have not been looked at during the field visit (information on these aspects was received as a result of desk review of available historic data).

Project footprints along the railway and access road that could potentially affect fishbearing water bodies include stream crossings (i.e., bridges and culverts) and encroachments by railway or road embankments. Bridges and culvert crossings were designed to minimize instream footprints but cumulatively, a substantial amount of stream habitat will nevertheless be displaced by placement of these structures. The EIA also mentions Turkestan catfish (Red Book) and other fish species which require protection.

Additional surveys will be done by the client to identify: (a) magnitude of current effects and expected impacts on specific Red Book/rare fish species, (b) routes of migration and spawning areas of these species, (c) period of time of migration to specify time limitations in contracts. Based on these surveys, targeted mitigation plans for protection of freshwater fish species in Akhangaran and, if necessary, Chadak rivers will be prepared by the client. These plans will be site-specific, will become part of the construction contracts and will specify, inter alia:

- special restrictive regimes for earthworks/excavation and construction broadly in water protection zones (i.e. banking of construction areas, arrangement of gabions, etc.);
- prohibition of works during spring spawning (specific time will be specified in contracts);
- scope of periodic monitoring of the conditions for fish migration in the area of works;
- arrangement of designated areas for waste materials/debris, localization and sealing of areas for machinery, fuels and lubricants, potentially hazardous substances, wastewater treatment facilities and/or tanks for subsequent transport and disposal at the nearest waste water treatment plant;
- careful planning of works in order to complete physical works in the water protection zones in the shortest possible time.

Impediment to fish passage in Akhangaran river and other fish-bearing streams is a major potential issue, and is therefore a focus for mitigation efforts. Culverts can impede fish passage due to excessive culvert length or flow velocity, or to a combination of length and flow velocity. Fish may also avoid long culverts due to darkness within the culvert. Mitigation measures include, but may not be limited to:

- culvert installation at the same slope as the existing stream;
- culvert lengths will be minimized;
- placement of rocks and boulders within culverts to reduce velocity, provide velocity refugia and mimic the natural stream bed;
- embedment of culverts by at least 20% to increase the wetted width at the culvert inverts;
- consideration to placement of baffle inserts or weirs in culverts on steep slopes and high velocities;
- placement of staggered boulder arrays downstream and resting pools downstream of culvert outlets

Other mitigation measures will be specified based on the survey results.

Effects of the works on sedimentation in general are expected to be small due to implementation of mitigation measures including sediment and erosion control measures during construction and operation of the Project, and water management such as the use of settling ponds.

Regarding terrestrial biodiversity it should be noted that, as indicated in the EIA, the tunnel "underpasses" the most valuable areas of the Kamchik pass. There will be local impacts on vegetation and animal species in the areas of the portals and technological shafts, but no Red Book/endangered species will be affected.

m. Health protection and labor safety

Regarding working environment, the basic requirements for safe working conditions shall be met. In connection with construction of the railway there were created comfortable living conditions for employees in five areas (Angren and Pap towns, near Akhangaran reservoir, in villages of Sardala and Chodak).

The Contractor shall develop a Plan for health and safety at work, including: risk assessment of workplace; measures and requirements for safety and health performance of construction works, risk factors, personal protective equipment, safe work instructions, plans for fire prevention and fire-fighting, emergency and evacuation plans for workers and occupants of the site, on-site contractor coordinator of health and safety and other requirements arising from legislation on labor protection.

All special works requiring permit/license (e.g. electric installation works, operating construction machinery, works at height, works with explosives, etc.) must be performed by a certified personnel who have had passed designated training on occupational health and safety. National and UTY's regulations on health and safety at work will be followed. Specifically, safety to workers and the general public will be enhanced through:

- (i) on-job briefing and training safety precautions, and their responsibilities for the safety of themselves and others,
- (ii) provision of protective gear, including clothing, hard hats, special footwear, and high visibility jackets for use when reconstruction activity is to take place at night,

- (iii) arranging for first aid facilities, readily available trained paramedical personnel, and emergency transport to the nearest hospital with accident and emergency facilities, and allocation of responsibility for ensuring that these arrangements are permanently in place,
- (iv) arranging for regular safety checks of vehicles and material, and allocation of responsibility to a suitably qualified Health and Safety officer for this,
- (v) ensuring that blasting is carried out and supervised by trained personnel, that explosives are stored in a secure location
- (vi) installation of warning signs, protection fence, at and around construction sites, and directing vehicle and pedestrian traffic away from sites and
- (vii) arranging regular safety and hygiene training for contractor staff.

The measures for ensuring the work safety will be determined and performed by documenting in logbooks, assignments of duties, etc. according to specified templates.

Electric installation works will be performed using electric protection equipment which will avoid electric power injuries, the electric arc effect and the products of its burning, as well as the impact of an electromagnetic field.

The Contractor has developed a Safety Plan (Annex 5) where identified the activities, procedures and conditions for performing of drilling and blasting operations, storage, transportation, acceptance and transfer of the use of explosive materials in the course of the project implementation with prevention of possible accidents, related incidents and willingness to implement special technical and organizational measures to rescue people, including:

- The collapse of rocks
- The flooding of mine workings
- The staff security
- The procedures for drilling and blasting operations
- The storage of explosive materials
- The fires in underground excavations and on the adjacent building sites.

Such measures are necessary in the view of strategic importance of the tunnel being constructed.

The workers shall wear masks during tunnel construction. The ventilation system in the tunnel shall be kept in normal working state to guarantee sufficient levels of ventilation. Construction inside the tunnel shall be stopped in case the ventilation system is damaged.

All listed above actions are displayed in Labor Safety Plan, which was approved on November 26, 2013. The Contractor of the tunnel has a consultant on safety, who is responsible for all activities on safety of works in the tunnel and in construction camps.

5. Monitoring of mitigation plan implementation

The Monitoring Plan is an important component of environmental management aspects relevant to the proposed works. Targets for monitoring the environment impacts and mitigation measures are: verification of performance of measures for decrease in environmental impact, determine the actual scale of impacts, and also correction of
measures for minimization of impacts if its efficiency isn't sufficient.

UTY is responsible for the implementation and monitoring of Environmental Mitigation Plan. The Monitoring Plan covers the measures related to all potential impacts described above, and it will be followed during the implementation of the proposed project. The UTY, through the PIU, will monitor the implementation of the Plan. Potential environmental impacts and safety of people can be avoided or mitigated by adopting good engineering practices. The contractors that will carry out the works will follow the requirements of national legislation on territorial planning and requirements to the monitoring format, stated in this EMF (see. Annex4).Monitoring plans will be prepared by Contractors for all objects which are in construction stage.

The results of monitoring activities will be summarized by the UTY in a quarterly report to be submitted to the regulatory authorities (RIEW and EEA) and to the World Bank. In case there are discrepancies with the statutory requirements for environmental, UTY develops additional mitigation measures for unforeseen impacts that exceed the established norms.

Competent authorities (Executive Environment Agency and Regional Inspectorates on Environment and Water) confirm the results of the monitoring and the proposed additional measures, where appropriate.

The Project Reports submitted to the World Bank on a quarterly basis will include a chapter on the Environmental monitoring activities.

6. **Control of environmental performance**

The control over implementation of environmental activities is conducted by:

Engineers conducting control over the construction under specific contract/area PIU of SJSRC (engineer-ecologist) - general control over conformity of works to EAF and EMP on sites/facilities

Representatives of the State Nature Committee of Uzbekistan and the Ministry for Emergency Situations of the Republic of Uzbekistan-periodic inspection and, if necessary

The World Bank will undertake overall control over implementation of requirements of the World Bank and recommendations of missions supervising the project.

At the present time, designated inspectors of the central office of the State Committee for Architecture and Construction check the project sites on a biweekly basis and checks compliance with architectural/construction norms, including environmental requirements. Monitoring is carried out by both Central (Republican) office, and regional branches (Tashkent region and Namangan region). Also, Environmental specialist of the State Committee of Environmental Protection undertakes monitoring of environmental performance, including radioactivity checks, waste material sites, tree cutting, etc. once a month.

Also, land slide control is being undertaken permanently by specialists (geologists) of Angren Center of Monitoring of Land-slide Areas.

According to the schedule approved by UTY and the Ministry of Health of June 16, 2014, the Institute of professional development of doctors, CSES, SJSRWC Uzbekistontemiryullari, as well as radiological laboratory, independently from each other, quarterly conduct laboratory and instrumental researches, namely radiological researches (radiological background, radon revealing, identification and sampling for revealing of radionuclides in soil dumps).

The UTY provided the results of monitoring of radioactivity and water quality (drainage) in the tunnel undertaken by the Sanitary Epidemiological Service of the UTY. The data suggests no excessive levels of radioactivity have been recorded. On water quality – the analysis suggest that parameters of suspended matter exceed the norms (shafts 2, 3, the main tunnel and the safety tunnel of Pap section of the tunnel). Also, the parameters "Oil and oil products", and "Greases and oils" are exceeded: traces are found at all monitoring points of Angren and Pap sections (except shaft #3). Targeted mitigation measures should be implemented soonest to bring drainage water quality to acceptable norms/standards.

The tunnel contractor has completed preparation of the detailed EMP for the tunnel. The document has to be reviewed by the State Expert Panel (Gosekspertiza) in order to formally approve it as a legitimate guidance for implementation during construction.

Factual control over the individual project sites will be based on visual assessment and analysis of performance records of construction works (for example, construction of a facility is carried out accordance with diagrams and drawings, recording of waste disposal). In addition to the audited physical aspects in the course of visits there will be studied the relevant supporting environmental documentation (i.e. EMPs should be comparable with the norms of best international practices) and appropriate implementation of measures stated in them. Specific control parameters will be determined as the integral part of preparation of each EMP. Usually this includes: the visual inspection of recycling process of construction waste, the fight against dust, and efficiency of land use, the general state of works on the facility (for example, compliance with safety measures during the storage of fuel and other hazardous substances), combating soil erosion and conservation of flora, as well as activities on restoration of environment, re-cultivation of lands, improvement of territories according to the legislation after accomplishment of construction works. In special cases, analyses of chemical and physical parameters is carried out for assessing the impact on the water surface (haze, contamination by POL products), underground water (contamination by POL products), and air (dust, soot, combustion products).

The responsibility for conducting control over the project rests upon the implementing agencies of the Borrower, it is likely that the State Nature Committee of the Republic of Uzbekistan will play a key role in the monitoring of compliance with established protection measures. Analysis of documentation of individual works or measures, as well as engineering and technical works, and local impact will be synchronized with semi-annual periodicity of standard observation missions of WB on the project.

Review and approval of site-specific EIA/EMPs

The following documents in Russian will be sent to IBRD for review and approval:

- Copy of the official letter about the positive conclusion of the relevant environmental authorities;
- Abstract (summary) of the EIA/EMP document in Russian;

- The full version of EIA/EMP document in Russian;
- Other documents and evidence, proving that all licenses, permits, approval for this type of activity is legitimate and reflect the expiration dates of data on permits;
- Documented evidence of disclosure and
- Minutes of public hearings (if applicable).

IBRD may request for translations into English of certain documents from time to time. The UTY will respond to such requests.

7. Public consultations and terms of information disclosure

Consultations are regulated by the requirements of Uzbek legislation in the field of nature protection and are carried out on a scheduled basis for each large-scale construction project. In accordance with the requirements of the Law "About ecological expertise" (25 May, 2000), the engineering and technical works of different scope, which have a negative impact on the environment, must in mandatory manner be consulted with the public, in addition to consultations of expanded format with branch policy makers of executive authorities of bodies of the Republic of Uzbekistan (protection of historical, architectural and environmental monuments).

In accordance with OP 4.01 of the World Bank for projects of "A" category it is necessary to disclose and consult with the public the preliminary version EMF before its final version will be approved. Consultations on EMF were organized in Tashkent and project region (Akhangaran and Pap) after the EIA and EMF were made public. For this purpose, there will be organized at least one consultation with the public in Tashkent and consultations in the project regions. Site-specific EMPs will be disclosed and consulted with the public in project regions. For remote sites where there is no affected population in the neighborhood, the EMPs will be disclosed only.

Stakeholders, including local communities, non-governmental organizations and representatives of local authorities should be notified in advance about the time and place of the hearings. The UTY/PIU is responsible for: a) informing and submission of draft documents for public consultation, (b) carrying out of hearings, and (c) recording the main substantive moments, composition of participants (the list), conclusions and recommendations for the next steps.

The EMF and EIA, satisfactory to the Bank, were publically disclosed prior to Appraisal. The public consultations took place on October 13-14, 2014. Site-specific EIAs/EMPs for other works (aside from the railway line and tunnel) will be prepared and disclosed publicly accessible locations in Tashkent and in project area when the respective feasibility studies are prepared and prior to the commencement of any works on site. The Client issued a notice in local media regarding the availability of the documents and inviting comments. For works carried out in areas where there are potentially affected people or sensitive sites, the Borrower and/or Contractor will also organize local public consultations. The Environmental Audit, and the resulting Environmental Action Plan, was completed and is incorporated into this EMF.

Minutes of public consultations on EIA and EMF are contained in Annex 7.

Annex 1. Executive Summary for the EIA

1.1. Scope of the EIA

Draft Statement on Environmental Impact Assessment prepared in 2012 as part of prefeasibility study highlights key environmental impacts and proposed mitigation measures with good level of detail. "Boshtransloyiha" coordinated preparation of these studies, including the EIA for this project. The EIA included the substantive independent inputs/views and conclusions of the specialists from 18 environmental, academic research, nature conservation institutions, agencies and organizations.

The EIA covers the following:

Information on project location. Railway route is divided into three sections: Angren -Sardala route is restricted to the river valley Akhangaran, characterized by diverse mountain river topography, Sardala - Koshminar route restricted to the cross passage through the Kurama Ridge, characterized by high absolute elevations, large height difference; Sardala - Pap is represented as a piedmont plain on the right bank of the Syrdarya river with a low-angle slope, disturbed by adyr uplifts and stream flowing down from the Kuramin range.

- Section 1.Introduction describes the policy, legal, and administrative framework for the project including the environmental assessment process.All specialized organizations who participated in the development of the EIA also indicated in this Section. Also this Section described all additional studies, research and development of environmental mitigation measures (Annex 2).
- > Section 2.Environmental features of the territory describes project areas (description of Tashkent and Namangan regions, river basins and detailed description of three sections: Angren - Sardala route, Sardala - Koshminar route and Sardala - Pap route). All water protection zone of the reservoir are also described in this Section. Railway line sections crossing the rivers and channelization areas given in Appendix 5 of EIA. All requirements (size, length, width and etc) to the coastal strip are indicated. Location of archaeological sites along the route of a new railway line are given in Appendix 6 of EIA. Description of radiation environment is given in paragraph 2.5. River valleys Syrdarya and Akhangaran are generally characterized by low level of radioactivity 12-20 mR / h, corresponding to the normal natural background, typical for the region. Based on the general laws of distribution of uranium in the rocks of the region, and taking into account the mandatory presence of uranium-bearing zones of other natural radionuclides - radium and thorium, it is possible that the designed tunnel can pass through species, with high radioactivity level. Hydrogeological conditions described by surveys performed by the State Service of the Republic of Uzbekistan for monitoring hazardous geological processes and JV "UZROSNEFTEGAZGEO". Common occurrence of landslide processes along the railway route is given in Appendix 8 of EIA. Detailed description of dangerous geological processes are given in the "Report on the results of engineering-geological studies" performed by the State Service of the Republic of Uzbekistan for monitoring hazardous geological processes. Feature of flora and fauna is given based on the research work "Characteristics of the flora and fauna of vertebrates and assessment of the

possible impact on their status as a result of construction of a new electrified railway line Angren-Pap" performed by Institute of the Gene Pool of Animals and Plants of Uzbekistan Academy of Science.

- > Section 3.Ecological analysis of design solutions: Paragraph 3.1 Land withdrawal and disturbance is prepared based on materials provided by the institute "UZDAVERLOYIKHA". The amount and composition of land seized for the needs of construction and construction impacts such as land disturbance, disturbance of vegetative ground cover on the surrounding land, formation of bald slopes, moulding boards are indicated in this paragraph. Requirements to populated localities are shown in paragraph 3.2. Consumption of water and sewage discharge at operation points are given in Appendix 14 of EIA. Also all possible contamination of surface and groundwater describes in paragraph 3.3. It is emphasis that the railway line significantly affects mountain rivers, the habitat of aquatic shellfish and the source of high-quality fresh water, in the design solutions it is necessary to make provision for water protection measures. Construction of bridges and straightening of channels associated with the conversion of topography within the channels must be preceded by assessment of the impact on the environment. Paragraph 3.4 describes the main impact (violation of the landscape, land and land cover in the construction of portals, faces, construction sites, shift settlements, laying access roads, arrangement of surplus stockpiles of rocks) on the environment at tunneling and characteristics of four wells which were drilled by SE "East-Uzbekistan geological survey search expedition" and SE "Central Geological and Geophysical Expedition" in order to study the geological construction. Paragraph 3.5 recommends to develop measures securing slopes stabilization and revivifying of soil and vegetation cover in the areas being disturbed during construction as violation of land-cover and truncation arrays of clay rocks are associated with the risk of landslide processes and gully formation due to surface runoff. Characteristics of bridges are given in Annex 15 of EIA. Implementation of construction work associated with the transformation of the relief within the channels, water protection zones and coastal strips affects hydrological parameters of watercourses and hydrogeological conditions of the territory. Therefore, when designing bridges, railroad earthworks within the channels and coastal strips, it is required to assess changes in these parameters on the environment. Paragraph 3.7 describes all possible impacts on flora and fauna.
- Section 4.Effectiveness of environmental measures: provides information on mitigation measures for preservation of land, population living conditions, surface and groundwater, radiation, dangerous geological processes, tunnel under the main mountain range, flora and fauna.
- Section Conclusions and Recommendationsstate that the project will have a number of important environmental impacts during construction and operation periods. With appropriate mitigation, particularly during the construction phase of the project, none of the impacts referred to in this report will be significant. It should be pointed out that the railroad will bring numerous social and economic benefits to the communities within the area. The EIA lists a number of recommendations on follow-up EIAs, mitigation measures (e.g. re-cultivation of affected areas, re-vegetation, etc.) and compensation payments.
- > Appendices provide supporting data for analysis and photos of the site.

English version and Russian version of EIA report are available.

1.2. Conclusion

Based on the information on design solutions, expected impacts and proposed mitigation measures, construction and operation of the railroad will not lead to irreversible negative environmental consequences.

Review of the Draft Environmental Impact Assessment by State Expert Panel (Expertiza)

The review of the draftEnvironmental Impact Statement (EIS) by the State Ecological Expertise (N° 18/115z of 26 February 2013) identified the need for additional researches, investigations and development of environmental protection measures on the following issues:

- To develop measures for securing of slopes and recovery of soil and vegetation cover in areas disturbed at construction of the railway, in order to prevent the development of landslide processes, as well as ravine formation atlopping of arrays of loamy rocks along the route;
- To provide detailed information about settlements that fall within affected zone of the projected railway and propose measures to minimize the negative impact of the intended activity for local population;
- To develop effective measures on protection of surface and ground water from pollution with oil products and sanitary wastes during construction and operation of the railway;
- To perform as a separate project the environmental impact assessment of bridges construction and breakthrough of channels;
- To provide detailed information about distribution areas of animals and plants in relation to the railway, and to develop measures on safeguarding of biodiversity;
- To provide detailed information on hydro-geological conditions and chemical composition of interstitial water, opened at construction of tunnels, and on the basis of this information to propose activities on drainage, treatment and reuse of water in tunnels;
- To provide detailed information on distribution of radioactive rocks along the projected railway line and, if necessary, to adjust the route in order to avoid opening of rocks enriched with radionuclides;
- To perform detailed engineering and geological research for the development of protective measures in landslip and landslide areas;
- Draft statements on environmental impact of construction of roadside quarries should be submitted separately in established by the legislation order;
- For drainage of sanitary wastes it is necessary to provide on crossing points and stations arrangement of local treatment facilities;
- To develop and submit for consideration the Environmental Impact Statement (second phase) prior to approval of the feasibility study in established by the law order;
- > To implement the project on recultivation of disturbed lands;
- To formalize in established by the legislation order the sanitary protection zone of the railway line;

In revision process of EIAthere were conducted additional topographical, geological and engineering surveys, as well as visual inspection of the territory, and was developed the detailed situational plan of the territory where the object was located. Additional requirements were taken into account, upon results of draft EIA consideration at the State Committee for Nature Protection.

The following organizations were involved in development of EIS:

- CentralHydrometServiceunder the Cabinet of Ministers of the Republicof Uzbekistan;
- State service of monitoring of dangerous geological processes;
- JV «UZROSNEFTEGAZGEO» LLC;
- Republican center of state sanitary and epidemiological control;
- SE «Integrated geological-survey and prospecting expedition»;
- Institute of genetic fund of flora and fauna at the Academy of Sciences of the Republic of Uzbekistan;
- State Biological Control of the Republic of Uzbekistan;
- Institute of archaeology at the Academy of Sciences of the Republic of Uzbekistan;
- Institute of seismology at the Academy of Sciences of the Republic of Uzbekistan;
- Central Aerogeodetic Enterprise;
- Institute «O'ZGASHKLITI DUK»;
- Medical-sanitary service of SJSRC "UzbekistonTemirYullari";
- Institute «Uzdaverloyiha»;
- State Committee of the Republic of Uzbekistan on Land Resources, Geodesy, Cartography and State Cadaster;
- SE «The Eastern Uzbek geological-survey and prospecting expedition»;
- SE «Central geological-geophysical expedition»

The project of the pass' tunnel through Kuramin ridge and Environmental Impact Assessment of the tunnel (Project EIS) were performed by the Institute OJSC «Gydroproyekt». External power supply scheme was developed by the Institute OJSC «Sredazsetproyekt».

Materials of EIS, as well as conclusion of the State Expertise on EIS and recommendations of the World Bank have identified the list of the most significant potential environmental impacts and proposed mitigation measures, which are listed below.

At the moment all recommendations of the State Ecological Expertise were fulfilled. (See Annex 2)

Additional research to conduct in accordance with the Opinion of the State Ecological Expertise

A series of documents were identified as necessary based on the results of the State Ecological Expertise's review (attached to this document) of the draft Environmental Impact Statement for the purposes of thorough analysis of the situation, more complete assessment of the impact on the environment and minimization of risks in this project.

The table below outlines the program of planned measures to be taken:

| N | Measures | Responsible Agency |
|-------|--|--|
| 1 | Submit design documents to the state ecological expertise before the completion of the main construction | |
| 1.1 | Project on reclamation of disturbed lands affected by the construction of railway lines, quarries and spoil dumps | State Research and Design Institute of Land (SRDIL – Uzgiprozem) |
| 1.2 | Project on sanitary-protection zone of the railway line | SRDIL (Uzgiprozem) |
| 1.3 | Project on phytomeliorative works to prevent erosion and compensate the damage to biological resources | State Institute of Research and Design of Forestry (SIRDF – Giproleskhoz) |
| 1.4 | Draft EIS of the construction of quarries and spoil dumps | Head Research and Design Institute of Transport – (HRDIT – Boshtransloyiha) |
| 1.5 | Draft EIS of the construction of bridges and cutoffs in the rivers | HRDIT (Boshtransloyiha) |
| 2 | Submit documents to State Environmental Expertise prior to launch of railway line operations | |
| 2.1 | Environmental Consequences Statement (ECS), which includes: | HRDIT (Boshtransloyiha) |
| 2.1.1 | Measures on using interstitial water, monitoring of such water's quality (tunnel) | PIU of SJSC Railway Company "Uzbekistantemiryollari" |
| 2.1.2 | Monitoring observation program of engineering- geological process during the period of railway line's operation | SJSC Railway Company "Uzbekistantemiryollari, state service on tracking Geohazards |
| 2.1.3 | Plan of measures to liquidate the consequences of dangerous engineering-geological processes | SJSC Railway Company "Uzbekistantemiryollari |
| 2.1.4 | Measures on monitoring the change in ecologic- floristic environment and keeping biodiversity situation along the railway lines | Institute of the gene pool of flora and fauna of Academy of Sciences of RU |
| 2.1.5 | Measures to prevent diversion of untreated wastewater from the railroad tracks into the water reserves and topography. Arrange the monitoring of the quality of wastewater diversion. | HRDIT (Boshtransloyiha), Specialized institution |
| 2.1.6 | Environmental standards for all types of environmental impacts of the railway lines (ELV, MPD. Waste). | HRDIT (Boshtransloyiha) |

Annex 2. Regulatory and Legal Framework of Uzbekistan.

Overview

Key elements of environmental legislation include:

- Constitution of the Republic of Uzbekistan,
- Presidential Decrees of the Republic of Uzbekistan, Governmental Decrees (Resolutions) of the Republic of Uzbekistan,
- Orders by Heads of executive authorities in oblasts of the Republic of Uzbekistan,
- Systems of state standards (GOST) and construction standards and regulations(SNiP),
- Systems of industry standards (OST [industry standard], RD [regulatory documentation], SanPiN [sanitary regulations and standards], PDK [maximum allowable concentration]and others),
- Systems of interdepartmental and departmental scientific and technical documentation.
- International treaties, conventions, agreements and other international legal acts, party (assignee) of which is the Republic of Uzbekistan.

The main documents which set forth the general provisions to ensure environmental safety, protection of public health and environmental protection are:

| Legislation | Year Passed | Purpose / Content |
|-------------------------|--------------------|---|
| | (Amended) | |
| Constitution of the | 1994 | Land, subsoil, air waters, forest, wildlife and other |
| Republic of Uzbekistan | | natural resources shall be utilized and, at same |
| | | time, protection shall be give |
| «Law on Environmental | 1992 | The general legal framework for comprehensive |
| Protection» | | environmental protection and for the use of |
| | | them, including environmental standards setting, |
| | | legal regime of specially protected area, rules and |
| | | procedures for the use etc |
| «Law on Ecological | 2000 | About the use of public ecological expertise and |
| Expertise» | | environmental assessment procedures |
| «On the State sanitary | 1992 | public relations on ensuring sanitary and |
| epidemiological | | epidemic wellbeing and radiation safety of the |
| supervision in the | | population |
| Republic of Uzbekistan» | | |
| «Law on Protection and | Approved in | About protection, use, and reproduction of flora. |
| Management of Flora» | December 26 | |
| | 1997/ New Laws | |
| | of the Republic of | |
| | Uzbekistan. 18th | |
| | Edition, p.2 | |
| «Law on Wildlife | dated 26 | About protection of wildlife habitats. |
| Protection and | December 1997 | |
| Management» | | |
| «Law on Atmospheric | 1999. | Including ambient air quality standards, emission |
| Air Pollution» | | standards and Guidelines for Application (#469- |

| | | 1999) |
|---|---------------------------|--|
| «Law on Water Pollution» | 1999 | Ensuring rational use of waters for needs of the population and economy branches, protection of waters from pollution, contaminations and exhaustions, prevention and elimination of harmful effects of waters, improvement of condition of water objects, and also protection of the rights and legitimate interests of the enterprises, institutions, organizations, farmer, dehkan farms and citizens in the field of the water relations. |
| «Law on Mineral Resources» | October 23, 1994 | borrow areas and quarries |
| «Law on Health Safety and Environment» | May 6, 1993 | Occupational Health and Safety |
| «Law on Protection Archeological Monuments» | October 13, 2009 | regulation of the relations in the range of protection and use of cultural heritage objects which is national property of Uzbek people |
| «Law on the Protection of Ambient Air» | dated 27 December 1996 | About protection of ambient air |
| «Law on Waste» | dated 05.04.2002 | About waste management |
| «On protection of the population and areas from emergency situations of natural and anthropogenic character» | Dated 20.08.1999 | |
| The Environmental Code of the Republic of Uzbekistan | 30 April, 1998 | |

The Environmental Code of RUz has the following fundamental principles:

- 1. Sustainable development of Republic of Uzbekistan
- 2. Environmental Safety
- 3. Systematic approach to environmental regulation
- 4. State regulation of environmental protection and resource management
- 5. Preventive approach to any contamination or degradation of the environment
- 6. Punishment for violation of environmental legislation of RUz
- 7. Mandatory compensation for environmental damage
- 8. Permitting system and monetary compensation for environmental impact
- 9. Use of the most environmentally sound and resource saving technologies , which use natural resources and have a minimal impact on environment
- 10. Cooperation, coordination and transparency of state environmental authorities
- 11. Encouragement to prevent, decrease and eliminate environment contamination and waste generation
- 12. Open access to environmental information
- 13. Priority given to national interests in use of natural resources and environmental impact

- 14. Harmonization of environmental legislation of RUz with principles and requirements of international laws
- 15. Details of environmental danger of any planned physical projects and mandatory assessment of impacts on environment and human health when making decision on its implementation

The main legal act regulating the environmental issues in the Republic of Uzbekistan is the Law "OnNature Protection" (1992). This law establishes the general principles of administrative and other regulations on protection of natural components and their systems; regulates relations in sphere of interaction of society and nature, arising at realization of economic and other activity related to impact on the environment; regulates the general ecological requirements for the siting, design, construction and operation of economic facilities.

The Law defines fundamentals of the state regulation of standards, licensing certain types of activities, ecological certification in the field of environmental protection, as well as the environmental impact assessment and ecological expertise (Article 24-27). The article 41 of the Law specifies the requirements in sphere of environmental protection at siting, and design of buildings, facilities, structures and other objects.

Legislative framework for environmental protection and natural resource management in Uzbekistan is being developed taking into consideration the environmental legislation's consistency with legal norms that regulate various aspects of economic activity. During the formation stage of the environmental legislation, the emphasis is given to developing and ensuring the implementation of the basic principles of environmental impact assessment. The law of the Republic of Uzbekistan "On Nature Protection" enacted in 1992 became fundamental legislative act affecting the development and improvement of the national system of environmental legislation. The law regulates the legal, institutional and economic framework for environmental conservation and a rational use of natural resources. The Law identifies the balanced and harmonious relations between humans and nature, the protection of ecosystems, natural habitat and individual facilities, and also a guaranty of the rights of citizens of the Republic to a favorable environment as the main priorities. The legislations developed and adopted in subsequent period are inherently developing and concretizing the provisions of sections and articles of "On Nature Protection" Law: "On Specially Protected Natural Areas" (1993), "On Air Protection" (1996), "On the Protection and Use of Flora" (1997), "On the Protection and Use of Fauna" (1997), "On Water and Water Use" (2003). "On Radiation Safety" (2000) and "On Waste" (2002).

The Law of the Republic of Uzbekistan "On Ecological Expertise" (25.05.2000) became effective in order to determine the legal framework for regulating the relations in conducting ecological expertise and harmonizing the legal norms with requirements. The work on the preparation of documents for Uzbekistan's accession to the Convention on Environmental Impact Assessment in a Transboundary Context compiled in Espoo (Finland) has been completed.

Environmental impact assessment of facilities in design process is being conducted in Uzbekistan since 1993. EIA procedures were formalized as the regulatory guidance documents in 1996. The Law of the Republic of Uzbekistan "On Ecological Expertise" was enacted and became effective in 2000. The Cabinet of Ministers approved the "Regulation

on the State Ecological Expertise in the Republic of Uzbekistan" in 2001. The laws "On Nature Protection" and "On Ecological Expertise" reflect the basic principles that should guide the development of documentation to substantiate the activities affecting the environment in the Republic.

International practice of environmental support procedures of facilities in the design stage was taken as a regulatory basis for ecological expertise process, the instrument of which is the EIA, that ensures comprehensive assessment of negative consequences of the proposed activity and substantiate the effectiveness of environmental conservation measures. The Law "On Ecological Expertise" defines the term "ecological expertise", establishes the ways of cooperation with international environmental organizations, as well as entitles a priority of international norms if the international treaty of the Republic of Uzbekistan stipulates other rules than those outlined in the legislation of the Republic of Uzbekistan on Ecological Expertise.

The law "On Ecological Expertise" defines: the goals of ecological expertise; types of ecological expertise (state and public ecological expertise and environmental audit); the basic principles of ecological expertise; legality, objectivity, validity, mandatory record of the ecological safety's requirements, presumption of potential environmental danger of any economic and other activities, the integrity of assessing the impact of economic and other activities on the environment and health of citizens. The article 11 of the Law contains a list of facilities subject to state ecological expertise: draft state programs, concepts, layouts and development of production sites, sectors of economy and the social sphere; pre-project and post-project documentation; drafts of regulatory-technical and methodological documents regulating economic and other activities on natural resources' use; documentation on creating new equipment, technologies, materials, substances, products; operating companies and other facilities with a negative impact on the environment and public health; documents for comprehensive research of areas for subsequent entitlement of specially protected natural territories' status, zones of ecological emergency and environmental disasters; all kinds of town planning documentation; facilities with a special legal regime.

For state ecological expertise on the facilities in a design process, in accordance with the article 15 of the law, the customer (the initiator of an economic activity) submits: – documents on environmental impact assessment (EIA) containing a draft environmental impact statement (draft EIS), environmental consequences statement (ECS) and environmental impact statement (EIS), which will be performed if the results of the expertise conducted on the draft EIS identified the need for additional studies, field surveys and developing well-defined environmental actions.

On existing facilities, the customer submits: drafts of environmental standards (Emission Limit Values (ELV), Maximum Permissible Discharge (MPD), Maximum Permissible Waste (MPW); and EIS, if the negative impacts of the facility on environment and the health of citizens were identified.

The law "On Ecological Expertise" also incorporates the public's conduct of the ecological expertise, the findings of which are of recommending nature. Environmental auditing is an independent environmental assessment of existing plants and other facilities that have a negative impact on the environment and it is conducted as per decision of the owner of the facility engaged in economic and other activities.

The State Committee of the Republic of Uzbekistan for Nature Protection (SCNP) is specially authorized state body in the sphere of state ecological expertise. According to the "Regulation on the State Ecological Expertise in the Republic of Uzbekistan" the following bodies of SCNP are responsible for state ecological expertise: the General Department for State Ecological Expertise (GDSEE); State Ecological Expertise of SCNP of the Republic of Karakalpakstan; state ecological expertise departments of SCNP in regions and Tashkent City. All bodies of SCNP on state ecological expertise constitute a single system of state ecological expertise service, methodological guidance of which is performed by the GDSEE. State environmental expertise is performed by staff experts of SCNP. Professionals of design institutions and firms engaged in developing EIA may act as developers EIA reports that are accompanying environmental support of the facility being reviewed. Neither licenses nor certificates are required to qualify for EIA reports' preparation in Uzbekistan. The regulation on the state environmental expertise identifies the list of activities which are subject to environmental expertise. The list divides the facilities into four categories by the degree of their environmental impact: the Category I includes the activities with high impact risk; the Category II includes the activities with medium impact risk; the Category III includes activities with low impact risk; the Category IV includes types of activities that have local impact. According to the Regulation, GDSEE conducts state environmental expertise of facilities engaged in activities that fall under categories I and II. The state environmental expertise of the Republic of Karakalpakstan, regions and Tashkent city conduct state environmental expertise of facilities engaged in activities that fall under categories III and IV. In order to conduct state environmental expertise on the facilities in design stage, the customer submits the EIA documents, which include the following stages:

• draft EIS, prepared on a concept stage of a proposed or projected activity prior to financing of the facility. The draft EIS includes: analysis of the environment prior to implementation of the planned activity; description of the main and auxiliary technologies in terms of impact on the environment and usage of natural resources; expected emissions, discharges, waste and their impact on the environment, methods of recycling and waste disposal; analysis of alternatives to the proposed activity; analysis of emergency situations (with probability estimations and prevention scenarios of their adverse effects); description of the types and features of exposure; analysis of the main objects that fall under the impact; impact assessment and forecast of environmental changes and environmental impacts as a result of the reviewed project's implementation; proposals of measures decreasing the environmental impact to the acceptable level;

• EIS is submitted prior to approval of the feasibility study of the facility subject to state ecological expertise. EIS includes: the assessment of environmental issues of the territory selected for construction of the facility as per results of both engineering-geological surveys and studies of the program included in the project; refined characterization of sources of environmental impact; analysis of the results of public hearings and, if necessary, amendments of reviewed activity's impacts on social conditions; assessment of the impact of the facility on the environment in relation to a specific site;

• ECS is submitted prior to launch of operations of the facility. ECS includes: amendments/corrections to design decisions, analysis of adopted measures based on the results of EIS and ECS' review done by authorities of SCNP; as well as proposals received during public hearings; environmental standards governing the activity of the facility being reviewed; main conclusions on possibility of conducting the economic activity. This document also includes the monitoring and environmental management for the period of facility's operation. Only draft EIA documents are submitted for facilities in design stage that fall under category IV. Based on the review of EIA documents, an authority of SCNP on state environmental expertise will prepare a state environmental expertise opinion, which includes the necessary information about the facility under review, technology used, organization of the work and environmental protection measures, possible negative consequences related to the activity of the facility and conclusions on whether or not the implementation of the facility is acceptable. The opinion is issued on official letterhead and signed by the Deputy Chairman of SCNP or by the chairman of the relevant committee on environmental protection. In case of disapproval of EIA documents, recommendations on necessary improvements to EIA and its resubmission for SEE are made.

The Republic of Uzbekistan has largely formed the legal and regulatory framework for the EIA procedures and accordingly trained personnel to conduct EIA both in internal and transboundary context.

Accession to the Convention on Environmental Impact Assessment in a Transboundary Context, together with other Central Asian states is a priority strategy and will beneficially be reflected on improving the environmental situation in Central Asia.

Environmental legislation of Central Asian countries includes basic provisions regulating the requirements of national EIA procedures, incorporating provisions on public's participation in decision-making process. In all countries of the CA region the law on "Environmental Impact Assessment" identifies the rights and duties of the public in the decision making process and remains as the major law that regulates the basic requirements to a proposed and existing economic activity.

Environmental legislation is represented not only by this main law. The relations that take place in various spheres of environment are regulated by such laws as ""On Nature Protection" (in some countries, "On Environmental Protection"), "On Specially Protected Natural Territories", "On Protection of Flora", "On protection and use of Fauna" "On Air Protection", "On Production Waste and its Utilization", "On Subsurface", Codes on Water, Land and Forest, the Code on Administrative Offences and Criminal Responsibility, and instructions, regulations, etc.

Environmental health regulations:

Sanitary Rules of the Ministry of Health The Republic of Uzbekistan:

- Hygienic requirements for working conditions of workers of construction companies 0023-94
- Organization of processes and hygiene requirements for production equipment 0208-06
- Sanitary norms and rules of radiation safety 0029-94
- Sanitary rules governing the activities of the State Sanitary and Epidemiological Service of preventive health surveillance 0222-07
- Sanitary requirements for the development of the maximum permissible discharge (MPD) levels for substances released into water bodies from sewage system 0088-99
- Sanitary norms of permissible noise levels in the workplace 0120-01
- Sanitary norms for general and site-specific vibration in the workplace 0122-01
- Sanitary Regulations for inventory, classification, storage, and disposal of

industrial waste. 0127-02

- Sanitary requirements for storage and disposal of solid waste into the special landfills in Uzbekistan. 0157-04
- Hygienic requirements for the protection of surface waters in the territory of the Republic of Uzbekistan. 0172-04
- Hygiene requirements for the protection of groundwater against pollution in the specific conditions of Uzbekistan. 0173-04
- Identification and assessment of noise and vibration hazards at the workplace
- Radiation Safety Standards (NRB-2006) and basic sanitary rules of radiation safety (OSPORB-2006) 0193-06
- Sanitary Rules of Radioactive Waste Management 0251-08
- Sanitary norms and rules when working with sources of radio frequency electromagnetic fields 0269-09
- Sanitary rules and norms for hygiene studies on soil protection against pollution in Uzbekistan 0272-09
- Hygienic requirements for the organization of building and construction works 0289-10
- Sanitary rules and norms of collection, inventory, classification, disposal, storage and disposal of industrial wastes in Uzbekistan 0300-11

Safety regulations

Rules regulated by the State Inspection for geological study of subsoil, safe operations in industry, mining and domestic sectors under the Cabinet of Ministers of the Republic of Uzbekistan

Law of the Republic of Uzbekistan On safety at the hazardous industrial facilities, 2006

Law of the Republic of Uzbekistan on Labor Safety, 1993

Law of the Republic of Uzbekistan on Radiation Safety, 2000

Law of the Republic of Uzbekistan on Subsurface resources, 1994

Law of the Republic of Uzbekistan on waste, 2002

Construction/engineering standards

Currently, all works on construction of all facilities (bridges, areas of alignment of riverbeds, pits, etc.) are carried out with observance of measures on environmental protection and on the basis of the following regulatory documents, norms and standards. :

- KMK (construction standards and regulations) 2.05.05-96 "Rail and Road Tunnels"
- KMK 2.05.03-97 "Bridges and Pipes"
- KMK 2.05.10-97 "Guidance on subgrade design of railways and roadways"
- KMK 2.10.10-97 "Land allocation norms for railways"
- KMK 3.06.01-96 "Railways. Organization, production and acceptance of work"
- KMK 3.06.07-96 "Bridges and Pipes. Rules of examinations and tests"
- KMK 3.06.05-98 "Rail, road and hydraulic engineering tunnels. Metropolitan railways. Production and acceptance of work"
- KMK 3.07.01-96 "Hydraulic engineering structures of rivers"
- KMK 2.01.03-96 "Construction in seismic zones "
- KMK 2.07.01-94 "Urban planning. Planning and development of urban and rural

settlements"

- KMK 2.01.08-96 «Noise protection»
- ShNK (Urban planning rules and regulations) 2.07.01-03 « Urban planning. Planning of development and building of territories in urban and rural settlements »
- KMK 2.02.01-98 «Foundations of building sand structures»
- KMK 2.03.11-96 «Protection of building structures from corrosion»
- ShNK 1.03.01-08 "Structure, order of development, agreement and approval of design documentation for capital construction of the enterprises, buildings and structures" and amendment No. 1 to it.
- ShNK 1.03.06-09 "Rules of carrying out State examination of pre-design and townplanning documentation.
- KMK 2.05.01-96 "Railways with the track of 1520mm. Design standards".
- KMK 2.01.01-94 "Climatic and physics and geological data for design".
- KMK 2.05.10-97 "Rules of design of the subgrade and road bed of the railways and highways".
- "Rules of technical operation of the railways of the Republic of Uzbekistan".
- GIN 07-035-03 "Guide on the maintenance and repair of the subgrade of the railway".
- GIN 07-032-03 "Guide on the maintenance of the railway".
- "Guide on the alarm system on the railways of the Republic of Uzbekistan".
- KMK 2.10.08-97 "Standards of land acquisition for electric networks of 0.4-750kV voltage".
- KMK 3.05.08-97 "Contact networks of the electrified transport".
- ShNK 2.05.02-07 "Highways".
- "Rules of organization and technical operation of the contact network of the electrified railways of SJSRWC "UzbekistonTemirYullari".
- Elaborations on the choice of the direction of new railway, executed by "Boshtransloyikha" (DE "Giprotrans") institute in 1994.
- Predesign works for construction of new railway Angren-Pap, executed by "Boshtransloyikha" institute in 2000.
- Feasibility estimates of construction of the new railway Angren-Pap executed by the institute "Boshtransloyikha" in 2003.
- Preliminary feasibility study is executed by "Boshtransloyikha" institute in 2012.
- Materials of subcontract design and survey organizations: "OzGASHKLITI DUK", "Gidroproyekt", "Tunnelmakhsusloyikha", "Sredazenergosetproyekt", "INKOMPROEKT", "Uzdaverloyikha", etc.

Annex 3. Action Plan for Physical Cultural Resources

Action plan providing for research and preservation of archaeological sites in the zone of the railway construction Angren – Pap which are an important cultural heritage of the Republic of Uzbekistan

As an action plan of research and preservation of the archaeological sites within the construction area, are described the procedures to be followed during the project in the area of railway construction Angren - Pap, which is a guide for both the General Contractor (Boshtransloikha) and the Client (UTY - State Joint-stock Railway Company) in case of destruction of historic/cultural monument.

Activities for research and preservation of the archaeological sites in the zone of the construction of the railway Angren - Pap will be carried out on the territory of ancient settlement of VI c. B.C. – IV c. A.C. - Chilhudzhra which represents, according to the scientific conclusion of the scientific staff of the State Museum Hermitage (St. Petersburg, Russia), a great historical significance and value for archeology, history and culture of the Fergana Valley, Uzbekistan and the whole Central Asia region. The conclusion of the State Museum Hermitage is contained in Annex 1.

Besides, activities for research and preservation of the archaeological monuments in form archaeological supervision will be carried out on the territory of the 4 burial mounds of I - VII centuries, a castle Oktepa of X – XII cc. A.C., an ancient mine of X - XII centuries. within the area of destruction of the projected railway. The boundaries of the specified monuments are in the conservation zone established by the Law. The monuments contain materials valuable for the ancient history and culture of the Republic of Uzbekistan and objects associated with funerary cults and rituals of ancient Turkic peoples of I - VII centuries, as well as remains of the unique monumental castle fortifications and architecture of X – XII cc AC. According to Article 3 of the Law of Uzbekistan "On protection and use of archaeological heritage" dated October 12, 2009 Ne 229-LRU "The archaeological supervision shall be a kind of archaeological research carried out in order to preserve the archaeological site and establishing an oversight of compliance with the requirements of conservation of cultural heritage during excavation, land utilization, construction, land reclamation, economic, road and other works within the boundaries of an archaeological site."

The UTY, Design Institute and designated contractors should make every possiblre effort to avoid damage of destruction of the historic and cultural sites and as much as possible place/divert the railway alignment away from these sites. With the destruction of these monuments takes place, a construction contractor will be obliged to stop the excavation for the time required for its full archaeological study and to call a group of archaeologists in order to conduct such a study.

On the territory of the ancient settlement Chilhudra of VI c. BC - IV c. AC the archeological excavations must be made in its northern section, the part of which is being destroyed during the construction of the railway. The area of planned archaeological research will include the parts of the ancient city adjacent to the road not yet destroyed, including the "conservation zone" at a distance of 100 m on each side of the track. The total area of the required archaeological excavations makes 4 hectares.

According to Article 11 of the Law of Uzbekistan "On protection and use of

archaeological heritage", "a partial or complete destruction of the archaeological monuments - exclusion of the archaeological sites from the State cadastre of tangible cultural heritage shall be carried out only after its final archaeological research."

In accordance with the legislation of the Republic of Uzbekistan the implementation of the archaeological supervision and archaeological excavations during earthworks and taking measures to prevent or minimize the negative effects of works for archaeological sites shall be realized at the expense of the Customer.

Determination of the Project area which is subject to archaeological research

The territorial scope of the project related to the action plan will be defined in the TOR of the Customer in accordance with the agreement on the supervision and archaeological sites. This action plan is part of the terms of reference to the Agreement signed between the Client (UTY), the General Contractor (BTL) and the Subcontractor - Institute of Archaeology, Academy of Sciences of Uzbekistan. The amount of the contract shall be determined by the general designer.

Budget and schedule

A provisional amount of the contract makes 195 million soms to be discussed. Of which, 150 million soms will be for study of Chilhudra, ancient settlement of VI c. BC – IV c. AC on the territory of which will be made excavations in the northern part of the settlement being in the area of the conservation zone;

- 45 million som would be provided for mandatory archaeological supervision and possible excavations (in case of destruction danger of the 4 burial mounds) of the cemeteries of I - VII centuries, medieval castles Oktepa of X – XII cc BC and an ancient mine of X - XII centuries. These sites are not subject to the direct site of a constructed road, but they fall into the conservation zone and are threatened by the construction activity. Today, a part of the mounds group KP 2 is destroyed by the builders who used the rubble of mounds for filling-up the railway bed.

The archaeological works are scheduled for the period from August to November 2014.

List, description and location of the archaeological sites in the coverage zone of the railway construction Angren – Pap.

All the sites listed below are included in the State cadastre of tangible cultural heritage of the Ministry of Culture.

According to Article 11 of the Law of Uzbekistan "On protection and use of archaeological heritage", "a partial or complete destruction of the archaeological monuments - exclusion of the archaeological sites from the State cadastre of tangible cultural heritage shall be carried out only after its complete (final) archaeological research."

Archaeological site being in the zone of destruction and subject to archaeological research

KP 3.The ancient settlement Chilhudzhra of VI c. BC – IV c. AC. The area of the settlement makes 8 hectares. The northern part of the settlement shall be destructed. The conservation zone covers the entire northern part of the territory of the ancient city. To save and preserve the material and cultural values in the cultural layers of the destroyed part of the ancient city, uncover historical topography of the city, its historical and cultural attribution, the whole northern part of the settlement should be subjected to archaeological excavations. The area to be excavated makes 4 hectares.

Coordinates of the settlement: Northeastern boundary: 40 51 '02,23" N 71 06' 54" E. Southwestern boundary: 40 50 '51,65" N 71 06' 41,53" E

Group of the archaeological sites subject to archaeological supervision and, in case of the destruction, to archaeological research.

1. AK 1. The ground necropolis with stone embankments.Diameter of the mounds up to 2 m. The necropolis coordinates: 41 03'71 .8'' N 070 12'61 .0 E.

2. AK 2. The mound burial consisting of five graves under mounds with earthen embankments. Embankments diameter: 8 - 10 m. Height: 1,5 - 2 m. Coordinates repository. 41 04'16 .0'' N 070 13 '96.8'' E.

3. AK 3. The mound burial ground consisting of five graves under mounds with earthen embankments. Embankments diameter: 8 - 10 m. Height: 1,5 - 2 m. Coordinates 41 04'18 .0'' N 070 13'96 .0'' E

4. AK 4. Oktepa is a medieval castle. Coordinates of the monument 41 08'89 .6 N 070 25'29 .1 E.

5. KP 1.The mine roadway - mine. Coordinates of mine 4103 '02,7'' N 070 43' 09,8'' E.

6. KP 2. The necropolis consists of 2 mounds groups including 9 graves under mounds of V - VII centuries BC. Externally emphasized pebble mounds diameter: 8 - 10 m and a height of 1.5 - 2 m.

Coordinates of the 1 group of mounds:

Mound 1 – 40 51' 27, 9" N 070 47' 32,9" E; Mound 2 – 40 51' 15,9"N 070 47' 38,2" E; Mound 3 – 40 51' 19,0"N 070 47' 36,3" E; Mound 4 – 40 51' 14,2"N 070 47' 39,4" E; Mound 5 – 40 30' 53,61"N 71 06' 42,69" E. Coordinates of the 2 group of mounds: Mound 6 – 40 51' 20,63"N 70 47' 24,33" E; Mound 7 – 40 51' 18,17"N 70 47' 24,56" E; Mound 8 – 40 51' 16, 49" N 70 47' 24, 87"; Mound 9 – 40 51' 10,72"N 70 47' 25,68" E.

Expected impact and the proposed mitigation measures

The earthworks during construction of the railway can potentially have an impact on the cultural layer of the archaeological monument and damage movable and immovable archaeological artifacts have a great cultural and historical value. In order to prevent the above-mentioned negative effects, the specialists of the Institute of Archaeology of Uzbekistan are carrying out an archaeological supervision. This archaeological supervision will be carried out using the monitoring methods of preservation of the archaeological sites: mounds, castle and ancient mines, cultural layers, lifting collection of archaeological finds and its office studies. During archaeological supervision, the archaeological experts will be present at the construction site, collect chance finds (archeological artifacts), make photographic images and graphics fixation of the cultural layer, describe artifacts, study and document it with subsequent reconstruction and preservation. During archaeological excavations, the archaeological experts will undertake stationary archaeological research, make photographic images and graphic fixation of the cultural layer, architectural measurements of the architectural and burial structures, describe artifacts, study and document the findings and its subsequent reconstruction and preservation.

The survey report will be provided to the Ministry of Culture of the Republic of Uzbekistan and the General Contractor.

Subcontractor's Duties

The Subcontractor – the Institute of Archaeology of the Republic of Uzbekistan shall undertake archaeological supervision and archaeological research of the below mentioned archaeological sites in the railway construction zone Angren - Pap. According to the results of archaeological excavations survey, the Subcontractor shall prepare a scientific report that would be presented to the Institute of Archaeology under the Academy of Sciences of Uzbekistan, Ministry of Culture of the Republic of Uzbekistan, the General Contractor and the Customer. The found historical and cultural assets should be transferred to the collections of the museums. The procedure for conducting archaeological works, further use or destruction of the archaeological sites (objects), scientific report, state registration and storage of the archaeological objects, as well as transfer of archaeological objects to the state, its assignment to the institutions of science, culture and education are governed by the Law of Uzbekistan "On protection and use of archaeological heritage" dated October 12, 2009 № 229-LRU, which is to be followed by the construction contractor. Documentaries (descriptions of artifacts and finds), materials of photographic and graphic fixation issued in the form of research reports will be deposited in the archives of the Ministry of Culture of the Republic of Uzbekistan and Institute of Archaeology under the Academy of Sciences of Uzbekistan. The finds, after its office studies and scientific publications, will be transferred to the Museum of History of Uzbekistan under the Academy of Sciences of the Republic of Uzbekistan and the Namangan regional museum and it will be stored and exhibited. Prior to transfer of findings and materials in the museum's funds, the Subcontractor - Institute of Archaeology of the Republic of Uzbekistan shall bear an institutional responsibility for its safekeeping.



AK 1.



AK 2.



AK 3.



AK 4.



ПК 1.



ПК 2.



КП 3.

Head ofTashkentDepartment Institute of Archaeology underthe Academy of Sciencesof Uzbekistan A.A. Anarbaev

S.R. Baratov

Leading research scientist Institute of Archaeology underthe Academy of Sciencesof Uzbekistan

Expert opinion about historical and cultural importance of the site of ancient settlement *Chilhujra*

The archeological site discovered by expedition of the Institute of Archeology at the Academy of Sciences of the Republic of Uzbekistan and located 1 km southward of Pap city is, undoubtedly, of great significance for culture and history. As exploratory researches carried out by our Uzbek colleagues has shown the main suite of cultural beddings of the historical site are of Eilatan-Aktam culture of Fergana (the early Iron Age, $6^{th} - 4^{th}$ centuries BC).

Eponymous monument of that culture – the site of ancient settlement Eilatan $(4^{th} - 3^{rd} \text{ centuries BC})$ located 20 km to the north-west of Andijan city was discovered in 1934 by B.A. Latynin. At the same time, he and involved T.G.Obolduyeva and A.P.Mantsevitch had carried out archaeological studies on the site. Later this settlement was studied by Yu.A.Zadneprovsky. Excavations of largest volume were conducted between 1959 and 1963 by T.G.Obolduyeva. The last researches on the site of ancient settlement were made by Uzbek archaeologist S.Kudratov in 1988-1990 who dated the age of top layers of the monument as 3^{rd} century BC. Today this monument has been lost.

The sites of this culture known to science are very few in number. These are remains of small settlements: *Sarvontepa* (Andijan city) studied by Uzbek archaeologist B.H.Matbabayev ($5^{th} - 4^{th}$ centuries BC) and *Simtepa* studied by N.G.Gorbunova (3^{rd} century BC).

Several articles of Eilatan-Aktam culture had been discovered and studied by N.G.Gorbunova in burials of Saka – cattle-breeding Kungay-Aktam culture (necropolises Aktam, Kungay, Sufap and etc.) developed in submountain part of the valley on its northeast ($6^{th} - 4^{th}$ centuries BC).

Materials of all few studies existed at our disposal, which represent the cultures of early Iron Age in Fergana valley, allowed until very recent times to assert the presence on its territory of Eilatan-Aktam cattle-breeding and agricultural culture, which in 3rd century BC developed into urban culture mentioned in Chinese chronicles of Shijie (the year 138 BC).

This brief historiographic excursion to studies of monuments of the early Iron Age in Fergana valley provided here illustrates the very poor state of knowledge about settled agricultural culture. Settled agricultural monuments of the early period (6th century BC) had not been known to archaeological science and the later known have not been subject for large-scale planigraphy studies.

The site of ancient settlement *Chilhujra* discovered by our Uzbek colleagues and bottom layers of which relates to 6th century BC, at present day is the most ancient and in this concern meanwhile is the only archaeological monument of Eilatan-Aktam culture of ancient Fergana valley known to the science. What is particularly important as preliminary studies of our Uzbek colleagues has shown, the settlement on the very early stage of its existence in 6th century BC had all elements in its structure peculiar to ancient city: well fortified citadel, twined with defense walls *shahristans* (city around the citadel) with located on their territories craftsmen blocks. This circumstance is particularly important for studying the ancient history of Fergana valley because explorations of Chilhujra settlement

may for the first time allow assertion that on the territory of this valley an urbanized culture had been formed in 6th century BC, i.e. for 300 years earlier than it was conjectured before.

According to our belief the site of ancient settlement Chilhujra, remains of architecture and fortification, archaeological articles (findings) which lie in its cultural beddings, have the great historical and cultural significance and value for archaeology, history and culture of Fergana valley, Republic of Uzbekistan, as well as the whole Central Asian region.

The settlement Chilhujra must without any doubt be studied by specialist archaeologists and, in no circumstances, cannot be subjected to anthropogenic impact without their involvement.

The present expert opinion was prepared by A.I.Torgoyev, the senior research fellow of the State Hermitage Museum's Division of Orient.

Senior research fellow of the State Hermitage Museum's Division of Orient Cand.of History Sc.

/signature/

A.I.Torgoyev

Seal /illegible/

Academic secretary of the State Hermitage Museum /signature/ M.M.Dandamayeva

Annex 4. Environmental Mitigation Plan

| Project Activities /environmental concerns | Potential Environmental Impacts | Measures to mitigate the impact | The cost of the mitigating measure (if significant) | Responsible implementer |
|---|--|---|---|--|
| | | Construction Stage | | |
| Surface flows, water reservoirs | Disturbance to the ecological system of watercourses and status violation of protected water zones | The construction of culverts are planned under the railways and temporary roads near the railways in order to preserve the flow of groundwater and surface water and permit the pass of irrigators and collecting drainages. | | |
| Construction of the railway lines | Land acquisition, including arable land, mechanical disturbance of the surface layer, including fertile layers; quarries and borrow pits, change of the landscape | For the purposes of rational use and conservation of land, prevention of soil degradation processes, reduction of adverse technogenic and anthropogenic impacts during the construction, the followings are envisaged: - the railway precinct is projected with the minimum required width, about 65% of the soil for railway embankment will be taken from borrow pits, via the movement of the soil on cut and fill basis from railway precinct to the place of embankment. As a result, the processing of quarries nearby the railway construction will decrease by 15.5 mn cubic meters, mechanically impacted land's territory will decrease via optimization of routes and traffic restriction (traffic will be only on the railway precinct and access roads), projections include funding for irrigation and reclamation of new lands equivalents for non-agricultural needs in exchange to irrigated farmland. 154.7 ha of low productive land is expected to be added into agricultural sector by reclaiming the land, | According to the preliminary calculations of expenses on conducting reclamation the cost of technical stage accounted for UZS 3.43 bn, and biological stage – UZS 3.92 bn. | SJSC Railway Company "Uzbekistantemiryollari OJSC "Boshtransloyiha" (HRDIT) |

| | | allocation of construction divisions within the settlements or at low-value lands is planned. | |
|--|--|--|--|
| Air Quality Dust generation from construction activities | Air Pollution: • emissions from construction vehicles and equipment, • emissions from concrete, asphalt mixing plants, stone crushers etc. Dust: • dust from construction activities • dust from earth works (disturbance | Ensuring that diesel equipment is operated and maintained properly Reducing dust generation by reduced speed limits Water will be sprayed on earthworks, temporary haulages and detour roads to prevent dust generation. Vehicles delivering fine materials like sand and fine aggregate shall be covered to reduce spills on roads. Do not use machines road construction machines as well as rail self-propelled machines with damaged engines; there shall also not have a prolonged idle running. It shall be ensured that the dust emissions from the crusher and vibrating screen at the stone quarries are | Contractor to be responsible in accordance with Environmental Specifications in Contract. Monitoring and management to be recommended and enforced by Supervision consultants. |
| Radiation | to soil There is a possibility of opening the massive material with high radioactivity. Their volume can be determined only in the tunneling. | within the emission standards. It is necessary to organize the measuring of Exposure Doze Rate (EDR) and concentration of radon in the air with the technician-documenter. In the case of hazard identification inform the Sanitary-Epidemiological Station of the Region and to develop an action plan to normalize the radioactive situation. In the case of possible opening of the massive radioactive material, the actions will be taken for their decontamination and transportation to the landfill of radioactive waste of "Navoi Mining Works" | Contractor to be responsible, Supervision consultants and also Central sanitaryepidemiologic service |
| Soil erosion and pollution | Potential for soil erosion (mainly by wind, but also by rain) caused by cutting of soil and sub soil and disturbance to soil and sub soil | Control soil erosion/ sedimentation through use of dikes, fiber mats, mulches, grasses, slope, drains and other devices. | Contractor to be responsible in accordance with Environmental Specifications in Contract |

| | Potential pollution of soil and sub soil from construction activities | | |
|---|--|--|--|
| Noise and Vibration (Construction activities and machinery) | Noise from construction vehicles and equipment on site Noise from concrete and asphalt mixing plants, stone crushers etc. Noise from vehicles on access routes | The construction equipment will strictly conform to Uzbek noise standards; Contractor develops work plan as considering with local residents Restrictions on working hours if night time noise impacts occur Within 200 m of the nearest habitation, construction work such as crushing, concrete mixing and batching, mechanical compaction, etc., will be stopped between22:00 and 06:00 hours. Vehicles and equipment used shall be fitted with exhaust silencers and shall be checked regularly. In residential areas, construction activity in that part of the railway line near the locality will be in a good organization primarily during any period, the technique is not idling, servicing heavy construction vehicles to travel on predetermined routes and approaches to comply strictly permissible speed when crossing the settlements, limiting working hours in time zones designated by local authorities, in the case of acoustic emission in a specific direction to use acoustic barriers (barriers) to break the line of impact from the noise source to receiver. | Contractor to be responsible in accordance with Environmental Specifications in Contract. |
| Quarries and borrow pits | Borrow pits • Disturbance to local environment, in particular dust and noise from equipment and vehicles; | All borrow pits and haul routes to be agreed before start of work Only licensed quarries and borrow sites will be used; precaution will be required to prevent the spillage of materials during transportation; all vehicles will be covered to avoid spillage during transportation of materials. | Contractors, Supervision consultants and Rayon Hokimiyats |

| · · · | | | 1 |
|---|---|--|---|
| | Local loss of trees and disturbance to wildlife; Impact on groundwater; Disturbance to agricultural activities Haul routes of material and equipment Noise and air pollution Danger to other road users, particularly pedestrians and non- | | |
| | • Disturbance to | | |
| | agricultural activities | | |
| Machines, equipment, and vehicles used for construction and transport | Emissions from construction equipment exhaust; Dust from vehicles, land clearing, grading, excavation, etc; Noise and vibration from transport vehicles | Excavated or stockpiled soil and sand shall be watered before loading, if there is a risk of dust generation, e.g., if it is fine materials or under windy conditions. Soil, sand, and other construction materials on transport vehicles shall be covered. Speeds of such vehicles shall be limited, particularly on unpaved areas. Fuel-efficient and well-maintained haulage trucks shall be employed to minimize exhaust emissions. Require the owners of the transport vehicles to only use properly registered and well-maintained vehicles with mufflers to mitigate noise and emissions; As a rule, the operation of heavy equipment shall be conducted within the time span 7am–7pm only unless otherwise agreed with local residents. | Contractor • ensures compliance with EMP visually inspects safety equipment use, observes vehicle noise levels, etc., • check trucks entering site to assess emissions and licensing, etc. Supervisor • monitor contractor's compliance with all provisions of the EMP |

| | | Construction equipment, which generates excessive noise, such as compressors, jackhammers shall be enclosed to prevent noise nuisance. | | PIU review quarterly environmental monitoring Supervisor's report Visual observe during site visit |
|------------------------|--|--|-------------------------|--|
| Tunnel construction | Proper spoil disposal Potential impact on drinking water safety for villagers Blast impact on community, safety concern; Impact on biodiversity | To the extent possible reuse spoils as embankment / subgrade or other facilities of the railway Consultation with local government and community as to reuse spoils for urban or community infrastructure construction Proper disposal of remain spoils in the identified spoils sites. Geological advanced probe boring and geological forecasting will be applied. Grouting will be used to seal the leakage, and water discharge will be limited. Tunnel liner will be timely and properly installed. Sedimentation and filtration ponds will be applied during tunnel construction sites to treat wastewater before discharged to nearby areas or water streams/rivers Strictly follow blast operation and safety codes. Prior notice will be announcement to local community Prior safety inspection of nearby buildings for determination of blasting method and dosage. Strengthening and relocation of buildings if necessary. Presplitting blasting, perimeter blasting and millisecond blasting technique will be used for tunnels in sensitive areas to minimize blasting impact on wildlife. Blast time arranged in daytime to minimize | Included in contract | Contractor to be responsible in accordance with Environmental Specifications of the Contract. |

| | ife | |
|--|--|--|
| Bridge construction Wastewater discharge to surface water bodies Within the tight t possible loss of wate during the construct actions need to be river with fuels and and material debris. •effluent drainage centralized sewerag projected sewage t connected to the exi •the soil from the of transported and uss quarries. The terr material debris and after construction's disturbed lands mus original condition th construction works. •Sediment will be disposal sites •No flushing and ma vehicles, construct disposal site allow protected area •Toilets at the constr the septic tank or discharge into the no- The domestic sewa prohibited to fre prohibited to fre prohibited to fre prohibited to fre | bed is preferred to be finished ime framework with the least er; ction and installation works the taken to avoid pollution of the lubricants, hazardous substances, in separate locations with no ge system is provided on the treatment facilities, also can be isting sewerage networks; development work sites will be ed for reclamation of designated ritory will be cleaned from the temporary construction facilities is completion. Reclamation of st be performed to bring into the he territory occupied during the properly disposed in dedicated intenance point for construction tion camp and borrow/spoil ved within the water source uction site must be provided with movable toilets, with the waste earby town drainage system. age of the construction site is ely discharge and is strictly ischarged into the source water | Design Institute "Boshtransloyiha" (HRDIT) |

| | | during construction. | | |
|-------------------|---------------------------|---|------------------|--|
| | | • Camp sites located outside the protection area. | | |
| Drainage | Earthwork activities | To deal carefully at bridge design and planning stages | | Contactor |
| congestion | during construction of | based on hydrological data. Ensure all earthworks and | | |
| | embankment may not | bridges are constructed according to design and | | |
| | induce drainage | specifications to minimize the drainage congestion | | |
| | congestion except at | hazard. | | |
| | culvert and bridge sites. | | | |
| Groundwater | Depletion of | The Contactor shall secure permission for groundwater | | Contactor |
| Extraction | groundwater | extraction from pertinent groundwater authorities | | |
| | Compete with existing | before establishing water wells. | | |
| | groundwater users | • Water conservation and recycling will be observed in | | |
| | | all aspects of constructions to include water main | | |
| | | breaks, watering roads for dust control, spraying | | |
| | | concrete, equipment cleaning and site clean-up | | |
| Interference with | physical impacts on | • Consult with subproject engineering staff to minimize | No/marginal cost | |
| existing | public infrastructure | physical impacts on public infrastructure and | | |
| infrastructure | and disruption to | disruption to services | | |
| (telecomm. or | services | | | |
| electricity etc) | | | | |
| | | | | |
| | Damage to plants | •All vegetation will be removed mechanically or | | Contractor |
| | | manually-no pesticides will be used. | | ensures compliance |
| | | Burning of vegetation is not allowed as well. | | with EMP |
| | | • All works shall be carried out in such a manner that | | |
| | | damage or disruption to vegetation is minimized. | | Supervisor |
| Cite alegative | | Trees or shrubs will be felled only if they impinge | | monitors |
| Site cleaning | | directly on the permanent works or necessary | | contractor's |
| | | temporary works. | | compliance with all |
| | | • Where feasible, a green belt will be developed within | | provisions of the |
| | | the railway stations | | EMP |
| | | • Trees will be planted at all station and depot areas. | | |
| | | having been selected for adaptability to the local soil | | PIU |
| | | and climate | | • review quarterly |
| | Erosion and sedimentation to water bodies, due to excessive clearing of vegetation or extended periods without vegetation. | Prior to any clearing of vegetation, make a species inventory of the area to be cleared. Use vegetation inventory to identify appropriate local plant species to be used for re-vegetation. Store topsoil separately from other soil and re-use for re-vegetation upon completion of works. Monitor re-vegetation regularly, especially during initial growth to ensure stable growth and lasting groundcover. | Expected that site cleaning, restoration and re- vegetation is included in contract estimate of the contract budget | environmental monitoring Supervisor's report • Visual observe during site visit |
|---|---|---|--|---|
| Solid Waste generated by construction activities | Construction materials (wood, steel bar, cement, etc.), paper, packing, domestic/human waste from work sites causing environmental pollution and adverse aesthetic impact | Prior to start of construction, develop an inventory of waste fractions expected to be generated during construction for approval of disposal routes and sites by Hokimiyat and SES Provide refuse collection containers and used oil collection containers at all construction sites and labor camps. Sell paper, resin, iron, and steel and other recyclable waste fractions to other enterprises for recycling. Dispose inorganic solid waste (concrete, bricks, etc.) properly after approval by Hokimiyat and SES. After completion of civil works, collect all garbage and waste construction materials from the sites, and dispose in specially designated places agreed by the SES. | | Contractor • ensures compliance with EMP • monitors waste stream to ensure maximum recycling. • Ensures proper disposal Supervisor • monitors contractor's compliance with all provisions of the EMP PIU-Environment Expert • review quarterly environmental monitoring Supervisor's report • Visual observe during site visit |
| Other Nuisance from | Nuisance and impacts from the construction | Include in contract clauses to reflect this, including the contractor's responsibility to mitigate nuisances, | | Contractor • ensures good |

| Construction - works | activities to neighboring activities and households. | noise, vibration, and dust impacts and other nuisances to neighbors. Ensure that contractor incorporates good construction management practices Ensure that contractor liaises with local community on approach to mitigation. Clarify by signboards on construction sites and/or stickers on equipment outlining how affected parties can lodge complaints. Ensure that contractor records complaints, response and resolution monitoring and includes complaints registration in regular progress reports. | construction management Supervisor • monitors contractor's compliance with all provisions of the EMP PIU-Environment Expert • monitors contractor's review quarterly environmental monitoring Supervisor's report • Visual observe during site visit |
|---|--|--|---|
| Physical Cultural Resources | "Settlement Chilkhudzhra" near the alignment | Archaeological surveys to be carried out by authorized experts at the historic site "Settlement Chilkhudzhra". In case of chance finds, work to be immediately stopped to allow for investigation, documenting/recording and recovery. (Sites not within alignment but within 2 kilometers of road must be protected from looting and destruction). | Institute of Archaeology of the Academy of Science of Uzbekistan. Protection of other historic and cultural sites is the responsibility of the Committee of Culture of Uzbekistan. |
| Increase risk related with safety and health based on labor standard and ignorance of environmental risks | Inadequate safety during work | Educate and train workers on regulations on work safety and risk prevention and to obey them Workers exposed to noise impact greater than 85 Db(A) shall wear hearing protection. Contractor shall make available all Personal Protection Equipment needed for workers, e.g. safety shoes, hard hats, safety glasses, and hearing | Contractor • ensures safe trenching methods • ensures workers' safety Supervisor • monitors |

| | protection | | contractor's |
|-------------------|--|-------------------|---------------------|
| | Training | | compliance with all |
| | • manning | | provisions of the |
| | | | |
| | | | |
| | | | Figure ant |
| | | | Expert |
| | | | • monitors |
| | | | contractor's review |
| | | | quarterly |
| | | | environmental |
| | | | monitoring |
| | | | Supervisor's report |
| | | | • Visual observe |
| | | | during site visit |
| Health safety and | Provision of adequate healthcare facilities (first aid) | Health safety and | |
| hygiene | within construction sites | hygiene | |
| Disease | • Personal protection equipment for workers, such as | Disease | |
| transmission | safety boots, helmets, gloves, protective clothing, | transmission | |
| Contamination of | goggles and ear protection | Contamination of | |
| wells | • Training of all construction workers in basic sanitation | wells | |
| Pollution form | and healthcare issues, general health and safety | Pollution form | |
| waste disposal | matters, and on the specific hazards of their work | waste disposal | |
| | • Clean drinking water to all workers | | |
| | Adequate protection to the general public, including | | |
| | safety barriers and marking of hazardous areas | | |
| | Safe access across the construction site | | |
| | • Adequate drainage throughout the camp to ensure | | |
| | that disease vectors such as stagnant water bodies | | |
| | and puddles do not form | | |
| | • Septic tanks and garbage bins will be set up in | | |
| | construction sites, which will be periodically cleared | | |
| | by the contractors to prevent outbreak of diseases. | | |
| | • Where feasible the contractor will arrange the | | |
| | temporary integration of waste collection from work | | |

| | | sites into existing waste collection systems and | | |
|---|---|--|-------------------------------|---|
| | | disposal facilities of nearby communities. | | |
| | . 1 | Operation & Maintenance Project Stage | 1 | |
| Spills of toxic materials | Damage to the environment and to people handling Haz- Mat, e.g. chlorine | Store all Haz-Mat in protected areas, with ample ventilation. Develop spill response procedures and provide spill response kits at all Haz-Mat storage areas. Include routine training in proper handling of chlorine and other Haz-Mat in the operation and maintenance (O&M) staff training, which covers the full range of technical and management skills required to safely operate the WDU Measures for decrease of concentration of pollutants | | Traction Substation's (TSS) managers: ensures safe Haz-Mat handling and storage develops spill response procedure and provides spill response kits |
| | | and also the emergency plan are provided | | |
| Erosion or scouring at waterway crossings, or on areas of fill or embankments Noise from operation of the railway on nearby residential areas (Train whistling, wheel track | From vehicles using road. From repair and maintenance activities | Implement stabilization and anti-scouring measures as required at bridges and culverts. Locomotive operators required to prevent whistling when passing near sensitive spots during day time and near village during night time, establishing green belts as sound barriers for sensitive spots. Planting of greenery will provide decrease of noise on the residential areas from trains to admissible level. | Inclusive in operational cost | UTYregional department • ensures that locomotive operators receives training |
| friction, stations) | | | | |
| All emissions from locomotives | | Locomotives will be regularly inspected to ensure that they are operating efficiently and emission standards are met. | Inclusive in operational cost | UTYregional department |
| Safety Measures | | Formulation regulations to impose speed limits, railway discipline and safety; Enforcing regulations with awareness building. Development of a coordinated signal plan along | Inclusive in operational cost | UzbekistonTemirYullari' s (UTY) |

| | | congested and critical locations. Signal control measures, including speed limits, will be enforced strictly. The automatic road locking equipment is considered to minimize risks. The stations for automatic control for rolling stock's technical condition are allocated. Within the tunnel system safety tunnel shafts with the exit to outside are considered for evacuation of people. | |
|---|---|---|--|
| Accidents that may involve hazardous substances | Risks to workers and facilities due to hazards related to fire and electric shock | Strongly established follow comprehensive safety regulations; Train and equip all O& M staff to follow the regulations on occupational safety and risk prevention; Install proper alarm systems; Ground all electrical equipment and provide circuit breakers Provide back-up water supplies for firefighting. | UTYregional department • ensures that O&M staff receives training in occupational safety from PIU |
| Potential animal crossing the railway tracks | Increase accident risk for the train | • Provide safety measures along the railway crossing the pastures. | UTY's regional department: • Periodically visual observation of defense and conducting necessary rehabilitation works |
| Transmission lines, electric power supply facilities | To be affected by electric shock, electromagnetic interference | Level of electromagnetic radiation power lines do not exceed acceptable | |
| Electromagnetic radiation impact on television reception | | Affected residents will be provided compensation to obtaining cable or satellite television. Overhead catenary system will be well maintained to minimize impact. | |

| *Note: The agree | ement for UZS 23 bn 983 m | In was signed between SJC ' | 'Uzbekistantemiryullari" and O | JSC "Boshtransloyiha" | . The amount will cover the |
|------------------|------------------------------|--------------------------------|--------------------------------|------------------------|---------------------------------|
| work on the des | ign of the project, geologi | cal exploration, research, de | eveloping the measures to mir | nimize negative impac | ts risks, project's feasibility |
| study, topograpl | ny, expenditures' projectior | ns for the project, working d | ocuments, requirements for er | vironmental protectio | n, examination and others. |
| The design inst | itute attracts contractors | to implement these tasks, | compiles and provides a sur | nmary of informatior | according to established |
| procedure to the | e Customer. Accordingly, th | ne total cost of a preliminary | work and activities in the amo | ount of UZS 23 billion | 983 million is included as a |
| separate item in | the expenditures projectio | n of the project as DSW (des | sign and survey works). | | |

Annex 4. Monitoring Plan

| Phase | What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored?/ type of monitoring equipment | When is the parameter to be monitored? (frequency of measurement or continuous) |
|---|--|---|---|--|
| CONSTRUCTION PERIOD | | | 1 | |
| Noise disturbance and vibrations | noise levels (dB); equipment | At and near construction site | Inspection and supervision; according to Uzbek noise standards | once a month or on complaint; |
| Noise disturbance to human | noise levels; equivalent noise level, | construction site; | noise meter and | once for each machine and |
| and animal population and workers | equipment | nearest homes | analyzer, inspection | equipment when works start and on complain |
| Dust/air quality | Air pollution (solid particles, CO, NO2, Pb (random sampling)) | At and near construction site | inspection | every 2 months; unannounced inspections during material delivery and construction |
| Soil erosion | Turbidity | At construction site | Visual observation by Supervisor engineer | Construction stage |
| Quarries, sand & borrow pits | Possession of official approval or valid operation license | Quarry, sand & gravel borrow pit | inspection | Before work begins |
| Water and soil pollution from improper material storage, management and usage | water and soil quality (suspended solids, oils, pH value, heavy metals) | runoff from site, material storage areas; wash down areas of equipment | inspection; observation | during material delivery and construction, especially during precipitation (rain, snow, etc) |
| Water and soil pollution from improper disposal of waste materials | water and soil quality (suspended solids, oils, pH value,) | site for disposal of waste material | inspection; observation | once every 4 months during construction and on complaint |
| Potential contamination of soil and water from improper maintenance of equipment | water and soil quality (suspended solids, oil, lubricants, fuel, pH value | At construction site; construction equipment place | unannounced inspection | once per month during construction, on complaint, and in case of spillage |

| Air pollution from improper maintenance of equipment (machinery) | Exhaust fumes, dust | At construction site | Visual inspection during work | During work |
|--|--|--|--|--|
| Vibrations resulting from equipment work | limited time of activities | Construction site | supervision | unannounced inspections during work and on complain |
| Traffic disruption during construction activity | existence of traffic management plan; traffic patterns | at and near construction site | inspection; observation | before works start; once per week at peak and non-peak periods |
| Reduced access to roadside activities | provided alternative access | Construction site | supervision | during construction |
| Physical cultural resources | All archeological property | "Settlement Chilkhudzhra" near the alignment | Visual monitoring by experienced and qualified staff | Regular site visits |
| Electromagnetic radiation | | | Site monitoring | |
| Vehicle and pedestrian safety when there is no construction activity | visibility and appropriateness | at and near construction job site | observation | once per week in the evening |
| Staff safety | protective equipment(glasses, masks, helmets, boots, etc); organization of bypassing traffic | At construction site | inspection | unannounced inspections during work |
| Overall workers' camp site conditions | Cleanliness, solid waste handling and disposal facilities, drainage conditions | On the camp site during construction activities | Unannounced inspection | According to the existing regulations |
| OPERATION PERIOD | | - | | |
| Erosion | Visual assessment of erosion resulting from project | Road subproject corridors | Visual assessment of erosion resulting from project | Twice/year for 3 years or after complaint. Mid-term and post-eval. monitoring. |

| Water quality | water quality | River and irrigation canals, Road corridor | Visual assessment of increased suspended solids from areas of | Quarterly |
|---------------|---|--|--|-------------|
| | | | erosion, if identified | |
| Noise | Noise sensitive spots along the railway | At sensitive locations: villages, river valley | Instrumental measurements | Monthly |
| Air Quality | | At sensitive locations: villages, river valley | Instrumental measurements | Monthly |
| Vibration | Vibration sensitive spots along the railway | | | 1 time/year |
| Soil | | At typical locations adjacent to right of way | Instrumental measurements | Monthly |

Annex 5. Safety Plan to ensure safety in emergency situations

APPROVED:

Authorized Representative of China Railway Tunnel Group Co. Ltd., (CRTG)

Zhou Xiaoguang _____

«____» _____ 2013.

Prepared by:

Representative of China Railway Tunnel Group Co. Ltd., (CRTG), Labour Safety Engineer

Zhang Deshang

(first name and family name) (signature)

«____» _____ 2013.

Safety Plan

to ensure safety in emergency situations

in the course of implementation of the project "Construction of the tunnel of Angren-Pap electrified railway line"

Tashkent 2013

Contents

1. Introduction

2. Objective

3. Safety control and management system in the tunnel and construction camps

3.1. Safety measures for main and interim construction camps

3.2. Safety provisions while transporting explosives and during drilling & blasting operations.

4. Developing schemes of control in high alert regime:

4.1.Ascertaining the order of reception, accommodation and provision of safety to workers and maintenance personnel with evacuation reception committee

4.2. List of evacuation committee members:

4.3. Duties of the chief of evacuation echelon

4.4. Management groups on routes of foot evacuation

5. The structure and tasks of evacuation groups

5.1. In daily activities' regime:

5.2. In high alert regime:

5.3. In emergency regime:

6. Ensuring public order and shelter provision to people at the assembling evacuation stations through set signals

7. Evacuation of machinery and property from the project when emergency situation arises

8. Contractor's (SJSRC "Uzbekistan TemirYollari") responsibilities and composition of the para-military guards

9. Organization of medical aid

10. Exploration.

1. Introduction

Construction of the railway tunnel between Angren and Pap and railway line has been started for the first time. Upon its completion, railway regional network of Kokand will be integrated with the railway network of the Republic of Uzbekistan. It will be no longer necessary to pass the territory of the neighboring Tajikistan. Railway network will be unified and represent one integrated railway system to form new railway transport corridor connecting the Southeast Asia to the Europe within previously developed Andijan-Osh-Kashgar corridor.

The route of the tunnel of new Angren-Pap railway line passes through piedmont and mountainous areas of economically developed Tashkent and Ferghana provinces of the Republic of Uzbekistan. It crosses the eastern section of Kurama Mountains along Kuindi and Sansalaksay rivers. (Aigirbaital).

Angren, the town with developed industry is the closest area to the construction site on entry portal side (elevation 1324.04 m.), then further comes Ahangaran and Tashkent. On the exit portal site (elevation 1464.59 m.) the closest areas with developed industry are the towns of Namangan and Kokand. Main bases of construction industry are located in these populated settlements.

Construction sites are linked to these populated settlements by motor roads of various categories.

Construction of the railway tunnel is being made by the China Railway Tunnel Group Co. Ltd. (China) within the framework of the project "Construction of Angren-Pap electrified railway line".

2. Objective

The goal of the present plan is to define activities, procedures and conditions for conduction of drilling and blasting operations, storage, transportation, acceptance and hand-over of explosives in the course of project implementation with prevention of accidents, and readiness to implement special technical and organizational activities to rescue people, localize and eliminate emergency, including:

- collapse of rock masses;

- flooding of minings;
- ensure intactness of the machinery and mechanisms of the Contractor;
- construction sites and base camps of the Contractor;
- ensuring safety of the personnel;
- procedures for drilling and blasting operations;
- storage of explosives and their transportation
- fires in underground minings and constructions sites adjacent to them;
- gas accumulation in the minings, explosions and other emergency situations;

These activities are required because of the strategic importance of the tunnel under construction, as well as because of the close vicinity to the state border with neighbor CIS states.

3. Systems of control and management in the tunnel and on construction camps.

An extensive network of data collection and control of ventilation units based on micro-processor technology is planned to be installed in the tunnel according to the design.

The use of micro-processor systems ensures:

- processing the data of the state of sub-station equipment;
- control of operation of the automatic fire signalization system;
- transmission of information to dispatcher's control panel via optic fiber cable;
- control of ventilation systems.

The used optic fiber cable communication line is designed both for video monitoring system and for the systems of monitoring and control.

- observation stations are to be installed with revolving projectors, with organization of 2 check stations at the gates and 4 guards (2 for daytime, 2 for nighttime).

- access of the personnel to the camp is envisaged through one check station only.

- contractor shall procuremanual metal detectors to be used to check personnel and other foreign people entering the territory of the camp;

- along the whole perimeter of the camps the contractor shall arrangeguard illumination with at least 5 lux covering adjacent territory from the exterior side of the camp;

- to ensure uninterrupted electric power supply the Contractor will install electric generator for cases of interruption of power supply.

3.1. Safety measures for main and construction camps

"Rabitsa" mesh walling will be installed along the perimeter of the camp. The second inner level of protection will consist of observation towers to be installed in the territory of the bases at Contractor's expense (according to Annex # 3 to the contract 230/1 dd June27, 2013).

Rotational method of construction with 24-hours regime of work of three shifts, each shift lasting 8 hours is adopted for the construction of the tunnel. 15 persons are required per one shift for one shaft face. (analogues - Rezak Pass and Kamchik Pass on a highway Tashkent-Osh)

Mine # 1 for 3 shifts 210persons.

Mine # 2 for 3 shifts 210 persons.

Mine # 3 for 3 shifts 180persons.

Mine # 4 for 3 shifts 140persons.

Mine # 5 for 3 shifts 140persons.

Line managers of production and maintenance units (foremen, mechanicians, heads of warehouses, surveyors etc.) make 10 % of the employees' number, which is equal to 100persons.

Total number of men residing in a construction camps is 1230 persons.

The construction camps is equipped with all infrastructure (canteen, storages, toilet etc.)

The construction camps is to be equipped with movable construction trailers for 10persons. All in all personnel for three shifts 20 persons. The number of trailers is 120 pcs.

Personnel is transported from the camp to work place by buses of 15persons capacity.

The number of buses makes 5 units.

Layout of observation towers and organization of guarding.



3.2. Safety provisions while transporting explosives and during drilling & blasting operations.

In accordance with existing regulatory documents of the Republic of Uzbekistan, explosives in emergency cases shall be transported using personnel and resources of the Ministry of Internal Affairs of the Republic of Uzbekistan.

4. Developing schemes of control in high alert regime:

- ascertaining the Plan of Evacuation and the list of personnel to be evacuated.
- organization of preparations for arrangement of joint evacuation stations.

4.1.Ascertaining the order of reception, accommodation and provision of safety to workers and maintenance personnel with evacuation reception committee

Upon receiving the order for evacuation following is done:

- Informing of the personnel about the start of evacuation, arrival time to joint evacuation stations;
- Plan of evacuation of the personnel comes into force;
- Interaction is kept with the management of transport vehicles unit;

- Keeping record of and reporting to the Contractor on the number of workers delivered to safe area (timewise, by kind of transport);

- provision of safety to workers on joint evacuation stations, boarding stations. on
- keeps interaction with evacuation reception committee, if required, send its representatives.

4.2. List of evacuation committee members:

- Chairman of the evacuation committee - Chief manager of the project of China Railway Tunnel Group Co. Ltd., (CRTG) for construction of Angren-Pap railway line.

- Deputy Chairman of the evacuation committee - Manager for industrial security of the China Railway Tunnel Group Co. Ltd., (CRTG).

Secretary of the Committee-

Members of the Committee:

- heads of Contractor'smain divisions;

- heads of structural subdivisions of China Railway Tunnel Group Co. Ltd., (CRTG) or their deputies;

- members of the committee (representatives of the local self-administrations, transport authorities, social welfare, health authorities etc.)

4.3. Duties of the chief of evacuation echelon

- prior to receiving the order for evacuation to know composition and number of workers and maintenance personnel in the echelon, locations of joint evacuation stations, boarding and un-boarding stations, number of the train wagons, their capacity, appoint seniors for each wagon;

- to arrive to joint evacuation station at a set time and together with his administration and senior of wagons to register arriving workers and maintenance personnel for evacuation and distribute them by wagons;

-- check availability of means for boarding (un-boarding) of workers and maintenance personnel, if required, create a team from contingent to be transported to install these means;

- to guide movement of workers and maintenance personnel from joint evacuation station to boarding stations and control boarding of the whole contingent;

- formalize transportation documents;

- upon completion of boarding inform transport authorities that the echelon is ready for movement;

- on the route watch that personnel being transported follow regulations of people's transportation and adopt activities to prevent accidents. If required to make in-time appeal to stop the echelon;

- at un-boarding station to organize unboarding of people from the railway wagons and their exit from station territory to movable evacuation stations;

- to inform evacuation reception committee the number and composition of workers and maintenance personnel arrived;

- upon completion of un-boarding of workers and maintenance personnel to place boarding (un-boarding) devices at a set place or as instructed by evacuation (transport) authorities leave them in the railway wagons to be used by subsequent evacuation echelons.

The chief of evacuation echelon during transportation is forbidden:

- to interfere with work of responsible transport people;
- to detain echelon over the time allotted for staying on schedule;
- to let personnel board or unboard until the trail has fully stopped;

The duties of the senior man of motor vehicle convoy while transporting personnel to be evacuated:

- prior to receiving the order for evacuation to know composition and number personnel to be transported, vehicle types allotted for transportation, their number, locations of joint evacuations stations, stations for boarding the motor vehicles, route of transport, un-boarding station, rules of transportation of people on motor vehicles, locations of accommodations for the personnel being transported in safe areas;

- to arrive to joint evacuation station at a set time and together with his administration and senior of motor vehicles to register arriving workers and maintenance personnel for evacuation and distribute them to motor vehicles;

- to guide movement of workers and maintenance personnel from joint evacuation station to boarding stations and control boarding of the whole contingent;

- formalize transportation documents;

- upon completion of boarding inform transport authorities that the motor vehicle train is ready for movement;

- on the route watch that personnel being transported follow regulations of people's transportation on motor transport and adopt activities to prevent accidents. If required to make in-time appeal to stop the motor train;

- at the un-boarding station organize un-boarding of workers and maintenance personnel from motor vehicles;

- to inform evacuation reception committee the number and composition of workers and maintenance personnel arrived;

4.4. Management groups on routes of foot evacuation

To organize foot evacuation columns management groups are organized headed by the chiefs of evacuation routes.

The management group consists of:

-communication chains - 3-4 men;

- movement regulation posts 5-8 men;
- detachment for ensuring movement 8-10 men;

- medical posts - 3 men. (Formed from the medical employees who are present on the construction sites).

Main tasks of management groups on foot evacuation routes are:

- organized dispatch of on- foot columns;
- keeping order and proper management on the route;
- preparation and maintaining route in proper state;
- making radiation and chemical exploration on the route;

- rendering medical aid to sick men on the way. (Organization of medical aid in the case of the emergency situation will be performed under provisions of the appropriate contract with UTY Medical Service).

5. The structure and tasks of evacuation groups

Planning, organization and conduction of evacuation of workers and maintaining personnel, industrial and auxiliary premises is direct responsibility of evacuation groups. Evacuation groups include:

- evacuation committee;
- evacuation reception committee;
- joint evacuation stations;
- evacuation reception stations;
- interim evacuation stations;
- management groups on routes of foot evacuation
- fast response groups for transporting out (for foot getting out) of workers and maintenance personnel to be evacuated.

5.1. In daily activities' regime:

develop plans of reception and accommodation of evacuated people, and activities for provision of food, water and first need items.

5.2. In high alert regime:

-ascertains plans for reception, accommodation and provision of evacuated people; - performs control of preparation over activities ot ensure first-need provisions;

5.3. In emergency regime:

- organization of reception of the arriving personnel, its accommodation and provision of food, water and first-need items;

- registration of arrivals, reporting to senior evacuation reception committee on the number of arrivals, conditions of their accommodation and provisions;

6. Ensuring public order and shelter provision to people at the joint evacuation stations through set signals

Assembling evacuation stations are to be located in places that ensure favorable conditions for gathering people and their dispatch. Available protective structures (shelters, basements and other deepened premises) are prepared on assembling evacuation stations or in close vicinity of them, or simplest shelters are arranged.

Assembling evacuation stations are created based on calculation: one assembling evacuation station near motor vehicle boarding station for sending all working people working in one shift.

Assembling evacuation station must ensure simultaneous accommodation for people enough at least for one echelon or column.

Assembling evacuation stations are to be provided with communication with project evacuation committees, transport boarding stations and with management of transport units;

Fast-response group carry out activities in case of emergency (un-delayable) evacuation;

Duties of the chief of evacuation echelon

The chief of the evacuation echelon is appointed by the order of the Contractor and reports to the appropriate Chairman of the evacuation committee, chief of joint evacuation station (during assembling workers and maintenance personnel at assembling evacuation stations) and to chiefs of railway station on the route.

Chief of the evacuation echelon is responsible for in-time arrival of workers and maintenance personnel for boarding, organization and carry-out of boarding and un-boarding, full use of railway wagon's capacity/

7. Evacuation of machinery and property from the project when emergency situation arises.

Upon receipt of the order of the Chairman of the Board of China Railway Runnel Group Co. Ltd., (CRTG) for evacuation of engineering- technical personnel and workers from construction sites and tunnel teams following activities are conducted:

- all personnel is informed about the start of evacuation. (See scheme);

- evacuation groups are deployed and made ready for action;

- leaders of construction sites and tunnel teams together with evacuation groups ascertain the order of evacuation activities in the given situation;

- assembling evacuation stations are deployed;

- transport vehicles arrive to personnel boarding stations for boarding of the personnel and loading technology and property;

- management and communication are organized to conduct evacuation in organized manner;

- evacuation committee sets tasks for the head of echelon, seniors on motor vehicles, heads of management groups of on-foot evacuation and hands them-over lists of workers to be evacuated;

- on boarding /un-boarding stations medical stations are deployed and medical escort is organized on their way;

- measures are taken to ensure material and technical supply;

- persons responsible for material and technical supply start their work with given conditions taken into account (time of the year, of the day etc.);

- exploring is organized to get much fuller and true data on the limits of the zones of emergency situation, radiation level etc.;

- leaders of echelons, seniors of motor vehicle convoys together with the chief of evacuation station conduct registration of engineering -technical personnel and workers arriving to the station and distribute them to transport types and ensure organized boarding onto the transport vehicle;

- personal protection devices are issued to all personnel servicing the railway tunnel under construction in case of arising adverse factors of the source of emergency;

- security is organized using the man-force and means of the para-military guards of the SJSC "U'zbekistonTemirYo'llari" on assembling stations and along the route of movement;

- Heads of echelons, seniors of motor convoys together with the head of evacuation station ascertain the route of transport (or on-foot evacuation) of the railway tunnel construction personnel to be evacuated;

- The head of the evacuation station simultaneously issues order to load the property and technology to be evacuated;

- the heads of echelons, seniors of motor vehicles convoy are to maintain public order among evacuees transported, and upon arrival to the evacuation reception station to conduct organized un-boarding of personnel arrived;

- upon arrival to the evacuation station immediately to inform reception evacuation committee the number and composition of the contingent arrived;

Reception evacuation station is deployed on un-boarding stations.

To ensure safe evacuation of people the tunnel, near-tunnel underground structures, servicing- technical premises and auxiliary premises, inter-tunnel evacuation passes, service tunnels, evacuation galleries, galleries for emergency and rescue teams, cable collectors - must be provided with evacuation ways and exits. Access galleries for emergency and rescue teams leading directly to the open air, inter-tunnel passes, service tunnels, evacuation galleries and access galleries for emergency-rescue teams should be considered the zones of safety of the tunnel.

Following are envisaged as ways of evacuation from the railway tunnel:

- evacuation ladders;

- service tunnels (shafts);

- evacuation galleries;
- inter-tunnel passes (box holes);

- to the shaft via box-hole and further to open air;

The doors must be made of corrosion resistant materials and coatings that ensure their proper functioning in the aggressive medium of the tunnel and mechanical washing for at least 10 years of operation.

To make emergency exit effectively visible it is recommended to install uninterrupted line of emergency light fixtures along its contours. The color of diffusing light - green.

Illumination of the emergency evacuation exit must be at least 10 lx.

Indicators of the direction of evacuation in the transport zone must be installed at an elevation of 0.5-1.5 m. from the floor level on the evacuation way and with spacing not more than 25 meters from each other.

The light fixtures of emergency (evacuation) illumination, illuminated indicators of the direction and "Exit" signs must be connected to emergency evacuation power supply, and in cases of breakdown, fire or other emergency must be re-switched for power supply to 3rd independent emergency power supply source (accumulative battery, diesel generator) that can operate in emergency mode for 3 hours.

It is forbidden to admit persons not familiar with the emergency plan or not familiar its part related to their workplace, with exit routes from danger zone or activities in case of emergency situation.

Personnel must be acquainted with the plan of emergency situation after it is approved in the course of primary instructing on the workplace, current instructing and extraordinary instructing on labor safety. If exit route to the surface is changed personnel should be familiarized within 24 hours.

On projects with ramified system of deep set minings that have two or more exits familiarization with evacuation exits must be done by direct passage of workers in the company of technical control persons from the workplace to the surface/

Evacuation of the personnel, machinery and property from the project when emergency situation arises

Because of considerable distance between the portals, utility premises are located on two construction sites # 1 and # 2 organized at two portals.

Composition of the structures and utility premises serving construction, located on near-portal construction sites and their specifications are cites on the table.

| # | Itom | Characteristics | | |
|------------|---|--|--|--|
| Item № | Item | Characteristics | | |
| 1 | 2 | 3 | | |
| 1. Constru | iction site # 1 | | | |
| | Main production unit of tunnel works | Area of the territory - 1.5 ha. | | |
| 1. | Storage pf inert materials | 3 storages for gravel (rock debris) each of 5 th.c.m capacity; | | |
| | | 3 storages for sand each of 5 th.c.m. capacity; | | |
| | | Inventory | | |
| 2. | Concrete plant | Productivity -20 c.m. per hour | | |
| 3. | Compressor room for concrete production | Productivity- 20 c.m. per min. | | |
| 4. | Cement storage | Capacity - 400 t. | | |
| 5. | Mechanical work-shop | Of container type (2 units) | | |
| | | | | |

Legend of ancillary enterprises

| 6. | Material-technical storage | Open concrete site - 2 th.sg m. |
|-----|--|---|
| 0. | | Heated storage - 36 sq m. |
| | | Shelter - 216 sg m. |
| 7. | Auxiliary mixer unit | Productivity - 10.7 kg/h |
| 8 | Site for repair and parking of machines and | Area, 1 th sa m |
| 0. | mechanisms | 1 metallic service rake incline for renair of cars |
| | | Shelter - 144 sg m. |
| 9. | Fuel and lubricants storage with filling station | 2 capacities for petrol each of 5 tons capacity |
| | 5 5 | 4 capacities for oil each of 200 I. capacity |
| | | 2 distribution posts |
| 10. | Reinforcement yard with a stand | Reinforcement structures - 1t/shift, |
| | for production of arch lining | and arch lining - 1 t/shift |
| 11. | Office | of container type |
| 12. | Fire station | for 2 posts |
| 13. | Canteen for 24 seats | of container type (2 units) |
| 14. | Toilet (rakeable) | for 2 seats (4 pcs) |
| 15. | Sanitary utility building | for 80 men |
| 16. | Shower-room | for 4 men |
| 17. | Medical station | of container type |
| 18. | Construction camp | for 200 construction workers |
| | 2. Construc | tion site # 2 |
| 1. | Storage pf inert materials | 3 storages for gravel (rock debris) each of 5 th.c.m. |
| | | capacity; |
| | | 3 storages for sand each of 5 th.c.m. capacity; |
| 2. | Concrete plant | Inventory, produces -20 c.m. per hour |
| 3. | Compressor room | Productivity- 20 c.m. per min. |
| 4. | Cement storage | for 400 tons |
| 5. | Auxiliary mixer unit | productivity 10.7 kg/h. |
| 6. | Site for repair and parking of machines a | nd Area-1 th.sq.m. |
| | mechanisms | 1 metallic service rake incline for repair of cars |
| | Fuel and lubricants storage with filling station | Sheller - 144 Sq m. |
| /. | Fuel and lubricants storage with ming station | 2 capacities for petrol each of 200 L capacity |
| | | 2 distribution posts |
| 8 | Reinforcement vard with a stand | for 1 t of reinforced goods and 1 t arch lining per shift |
| 0. | for production of arch lining | |
| 9. | Canteen for 24 seats | of container type (2 units) |
| 10. | Office | of container type |
| 11. | Fire station | for 2 posts |
| 12. | Toilet (rakeable) | for 2 seats (4 pcs) |
| 13. | Sanitary & utility building for 80 men | for 5 men |
| 14. | Shower-room | for 4 men |
| 15. | Medical station | of container type |
| 16. | Construction camp | for 200 construction workers |

SCHEME

Of alerting all workers on the construction of railway tunnel on their residences or workplaces on emergency situations and on the start of evacuation

| Chairman |
|---|
| of the Board of China Railway Tunnel Group Co. Ltd., (CRTG) for construction of Angren - Pap railway tunnel. |
| |

General Construction Manager



List of management personnel and institutions (form N $^{\circ}$ 2), who should be informed immediately of the emergency, must accord to the managerial personnel structure of the organization whose duty includes the work on activation of anti-emergency protection and implementation of activities as part of memergency mitigation plan. Form # 2

| # | Institutions and persons should be listed in this | Family name First | Telephone number | | Location | |
|----|--|--------------------|------------------|--------|----------|--------|
| | order. | name Father's name | Mobile | Office | Mobile | Office |
| | | | phone | phone | phone | phone |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Mountain rescue detachment (on duty) | | | | | |
| 2 | Fire brigade (on duty) | | | | | |
| 3 | Technical leader of the Contractor's organization | | | | | |
| 4 | Leader of the Contractor's organization | | | | | |
| 5 | Leaders of construction sites and tunnel teams | | | | | |
| 6 | Technical experts of the emergency project | | | | | |
| | (mechanician, electrician) | | | | | |
| 7 | Chief experts of the organization (mechanician, | | | | | |
| | power supply expert, surveyor, geologist etc.) | | | | | |
| 8 | Technical leaders and heads of other | | | | | |
| | organizations (subcontracting) performing work | | | | | |
| | on emergency section. | | | | | |
| 9 | Head of the Custormer organization - SJSC | | | | | |
| | "Uzbekistan TemirYollari" | | | | | |
| 10 | Labor safety service of the Customer- organization | | | | | |
| | - SJSC "Uzbekistan TemirYollari" | | | | | |
| 11 | Regional authorities of State Inspection | | | | | |
| | "Sanoatgeotexnazorat" of the Republic of | | | | | |
| | Uzbekistan | | | | | |
| 12 | State Inspection for Labour Safety of Tashkent and | | | | | |
| 10 | Namangan provinces | | | | | |
| 13 | Appropriate Law enforcing bodies of Tashkent and | | | | | |
| | Namangan provinces. | | | | | |

7.1. The routes of evacuation of the working contingent on motor roads by motor vehicles (on foot)

The roadway passes high elevations (absolute height off 1350 to 2000 meters) with maximal use of field roads (animal roads) and pack roads.

Maximal longitudinal include - 12%. Minimal radius of the curves on a plan - 15.0 m. Length of motor road to the entry portal makes 3.6 km. Length of motor road to the exit portal makes 3.2 km Following motor roads exist in the areas of designed railway tunnel: -Highway A-373 Tashkent - Osh Category of road - 1b -Width of the earth roadway - 26.0 m. -Width of roadway - 2x7.5 m. Coating - asphalt-concrete -Motor road 4K "Khanabad- Chadar-Altinkan-Sonsalak" Category of road - IV-V -Width of the earth roadway - 5.0-7.0 m. -Width of roadway -3.5-4.0 m. Coating- black, gravel All existing field roads (animal roads) and pack roads are connected to these roads. Preliminary designs define main temporary motor roads required for construction of

Preliminary designs define main temporary motor roads required for construction of the tunnel of the railway. Scheme of routes for the traffic of transport vehicles for transportation of the personnel, construction materials etc., for evacuation of sick and in cases on non-standard situations are shown on fig.# 01, 02.

| # | Types of construction machines, mechanisms and | Quantity | Kind of evacuation |
|-----|--|----------|--------------------|
| No. | motor transport | Quantity | |
| 1 | Hydraulic drilling unit C-6 | 1 pc. | |
| 2 | Excavator EC140BLC | 10 pcs. | |
| 3 | Loaders -50 | 10 pcs. | |
| 4 | Loaders -40 | 10 pcs. | |
| 5 | Air compressor – 20 c.m.per min | 18 pcs. | |
| 6 | Diesel generator - 300 KW | 5 pcs. | |
| 7 | Diesel generator - 500 KW | 9 pcs. | |
| 8 | Fuel filling machine- A25C | 5 pcs. | |
| 9 | Trucks -25t | 37 pcs. | |
| 10 | Loading machine - ITC312SL | 1 pc. | |
| 11 | Loading machine -WZ300 | 1 pc. | |
| 12 | Loading machine - ITC312SL | 2 pc. | |
| 13 | Drilling machine for several hole drilling -tribrachia | 6 pcs. | |
| 14 | Drilling machine for several hole drilling -tribrachia | 2 pcs. | |
| 15 | Humidifier - "Robot" CSS3 | 5 pcs. | |
| 16 | Concrete carrier-mixer - 8 c.m. | 26 pcs. | |
| 17 | Cement pump for pumping the mortar -60 c.m.per h. | 4 pcs. | |
| 18 | Cement pump for pumping the mortar -40 c.m.per h. | 8 pcs. | |
| 19 | Concrete&grout centre - 90 c.m./h. | 4 pcs. | |
| 20 | Concrete&grout centre - 30 c.m./h. | 5 pcs. | |
| 21 | Battery operated lorry - 20 t. | 14 pcs. | |
| 22 | Ore transporter – 25 c.m. | 22 pcs. | |
| 23 | Battery charger- 60 kW | 12 pcs. | |
| 24 | Axial ventilator - 2*37kw | 4 pcs. | |
| 25 | Axial ventilator - 2*132 kw | 1 pcs. | |
| 26 | Axial ventilator - 2*160kw | 1 pcs. | |
| 27 | Axial ventilator - 2*200 kw | 4 pcs. | |
| 28 | Flow ventilators- 55 kw | 10 pcs. | |

7.2. Property and technology to be evacuated

| 29 | Transformers - 800KVA | 2 pcs. | |
|----|--|----------|--|
| 30 | Transformers - 630KVA | 14 pcs. | |
| 31 | Transformers - 500KVA | 2 pcs. | |
| 32 | Transformers - 400KVA | 16 pcs. | |
| 33 | Transformers - 315KVA | 2 pcs. | |
| 34 | Wheel crane- 25 t. | 2 pcs. | |
| 35 | Floating switches -80* | 4 pcs. | |
| 36 | Water pumps - 75KW 100m | 6 pcs. | |
| 37 | Water pumps - 150KW 160m | 22 pcs. | |
| 38 | Transporting machines | 6 pcs. | |
| 39 | Flushing machine | 2 pcs. | |
| 40 | Truck for transporting explosives - IT | 5 pcs. | |
| 41 | Pneumatic drills- YT28 | 140 pcs. | |

8. Employer's (SJSRC "UzbekistonTemirYollari") responsibilities and content of militarized guard responsible for protection of the site will be provided in the Employer's Safety Plan.

9. Organization of medical aid

Organization of medical aid in the case of the emergency situation will be performed under provisions of the appropriate contract with UTY Medical Service. CRTG will provide its own medical equipment, transport etc.

- medical provision;
- staffing with medical personnel;

- provision of medical items, transport, radiation and chemical exploration devices, (personal protection devices for all medical personnel).

- provision of means of medical protection for the personnel to be evacuated (АИ-26 ИПП-8).

(Schemes No.01,02 for evacuation of patient or injured person in fire and emergency situations are attached hereto)

10. Exploration

Exploration is applied to obtain much fuller and true data on the limits of emergency zones, level of radiation, nature of destructions, state of road network, transport structures etc.

Special kinds of exploration will be organized in collaboration with the Employer and relevant authorities on a contractual basis to get the data on situation related to risks of:

- radiation;
- chemical;
- fire;
- engineering;
- -medical;
- -veterinary;
- -phytopathological;







Construction of new electrified railway Angren-Pap

The World Bank

SJSRWC «Uzbekiston Temir Yullari»

ENVIRONMENTAL AUDIT and ENVIRONMENTAL ACTION PLAN

Tashkent, 2014

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9. LIST OF ABBREVIATIONS AND ACRONYMS

| China Rail and Tunnel Group |
|---------------------------------------|
| Executing Agency |
| Exposition dose rate |
| Environmental Impact Assessment |
| Environmental Management Framework |
| Environmental Mitigation Plan |
| Government of Uzbekistan |
| Town Mayor Office |
| Project Implementation Unit |
| State Committee for Nature Protection |
| Construction norms of Uzbekistan |
| Transmission line |
| Terms of Reference |
| Uzbekiston Temir Yullari |
| World Bank |
| |

A. EXECUTIVE SUMMARY

1. Construction Activities and Project Progress

The designed railway line Angren-Pap passes through the Tashkent and Namangan regions and connects railway ring of Fergana Valley to the general railways network of Uzbekistan. The railway line crosses the Kuramin mountain ridge dividing the Fergana and Chirchik - Angren intermountain depressions.

The route of the designed railway line to the considerable extent passes across the basins of the rivers Akhangaran (37 km), Chadak (51 km). After the station Koshminar to the Pap station (35 km) the railway route passes the basin of Syrdarya river.

As of September 30, 2014 construction organizations of SJSRC "Uzbekiston Temir Yullari" carried out 33.0 million cubic meters of earthworks, including 10.5 million cubic meters of drilling-and-blasting works.

The road bed throughout 82 km of the railway section is built, 80 km of materials of the permanent way are laid. 192 artificial constructions, including 11 bridges and 3 overpasses are constructed.

Design estimates for construction of 98 km of the railway bed are provided.

Deepening of the main tunnel body made 4784 meters, including from the western portal - 2831 meters and eastern portal - 1953 meters; in the body of emergency adit - 5261 meters. Including from the western portal – 3167 meters and eastern portal – 2094 meters.

Total length/scope of tunnelling works made is 14933 meters.

SJSC "Uzbekenergo" developed tender documentation for purchase of the equipment and materials according to the World Bank procedures for construction of facilities of external power supply.

2. Report Purpose and Rationale

As defined in the Environmental Management Framework (EMF), Environmental Audit of works carried out previously will be undertaken and its findings will be included in the final version of the EMF. This audit is to be prepared by the borrower in order to evaluate and assess overall project compliance with environmental requirements of national legislation of Uzbekistan and those of the EMF.

The purpose of this Environmental Audit is to document the environmental management activities and compliance with the approved EMF for the period between construction start and October 31st 2014. This report is prepared in accordance with the TOR, approved by the WB (Attachment 1).

Environmental Monitoring Results are contained in Attachment 2.

3. Project Organization and Environmental Audit Team

There has been no change in the project organization during the reporting period. UTY is the Executing Agency (EA) with responsibility for the following activities:

- > timely provision of agreed counterpart funds for project activities;
- monitoring and evaluation of project activities and outputs, including periodic review, preparation of review reports reflecting issues and time bound actions taken (or to be taken);
- involving beneficiaries and civil society representatives in all stages of project design and implementation;
- public disclosure of project outputs;
- > quality assurance of works, and services of consultants and counterpart staff;
- complying with all loan covenants;
- > ensuring project's sustainability during post implementation stage

The Project Implementation Unit is responsible for day-to-day management of project implementation. The PIU cooperates with OJSC "Boshtransloyiha", the State Committee of the Republic of Uzbekistan on Nature Protection, the State Committee of the Republic of Uzbekistan on Architecture and Construction and each of the involved ministries and agencies to ensure effective and continuous exchange of information with all project partners. The PIU ensure coordination of all project activities, procurement of works, goods and consulting services for project implementation, control and monitoring activities within the project, and routine reporting to authorized services.

As part of the ECAPDEV¹³ Grant, the Consultant, AI Mar Consulting is contracted by the UTY to prepare this Environmental audit.

This report is prepared by:

Mrs. Alekseeva Yulia – Environmental Expert Mrs. Valikhodjaeva Gulnura - Environmental Expert

4. Methodology and Scope of the Environmental Audit

The environmental audit report was prepared based on the following:

- Desk review/analysis of the documentation. Various design and other projectrelated documents have been reviewed in order to compare with the information obtained during direct observation and of the interviews.
- Field visits/survey and direct observation. The audit team visited the whole alignment of Angren-Pap railway observing carefully the aspects of interest for the study.
- > Work on cartographic and photographic materials.

Three field visits were organized:

- The first field visit was conducted on October 2nd and 3rd, 2014. Project team was accompanied by Mr. Djamil Shafikov, Environmental Expert of Design Institute Boshtransloiha, and
- The second field visit was conducted on October 27, 2014, and

¹³ECAPDEV is a Multi-Donor Trust Fund with initial pledge of resources from the Government of Russia. is meant to support the quality project preparation in eligible countries - ECA countries with a 2010 GNI per capita It of US\$4,000 or less. Uzbekistan qualifies for the ECAPDEV.

• The third field visit was conducted on 31 October 2014. The team was accompanied by Mr. Kushner, Consultant for industrial safety (CRTG and Mrs. Shindina, Environmental expert of CRTG. It was inspection of all tunnel shafts.

With regards to photographic documentation, although many photographs were taken during the field visits, the team used only those which contribute to better understanding of issues highlighted in the report.

B. ENVIRONMENTAL AUDIT FINDINGS

1. General

This chapter presents the findings of the audit and is separated into the following main subsections:

- a) Re-cultivation of embankments (the area/section between Akhangaran reservoir and Northern portal of the tunnel and area between the Southern Portal and Chadak)
- b) Stabilization of river banks (near bridges etc.)
- c) Stability of liquid waste storage near Chadak.
- d) Electricity supply
- e) Quarry Sites and Borrow Pits
- f) Safety Provisions
- g) Monitoring of environmental performance by the UTY, contractors and regulatory authorities

2. Re-cultivation of embankments

For development of the project of land reclamation the contract is signed between SJSRC Uzbekiston Temir Yullari and "Uzdaverloyikha" institute. Deadline of the project development is December, 2014. The project will provide for implementation of construction finalization, restoration of natural drain, embankments protection works, restoration of the mode of water protection zones and coastal and protective strips.

Re-cultivation of disturbed land cover on completed objects is being implemented. Thus, in view of the fact that the most part of the considered section of the railway passes directly in the bed of the river Akhangaran, works on the bed straightening are conducted.

All Contractors intends to start phytomeliorative works (planting of trees and shrubbery vegetation) on the slopes of the completed construction along the route of the railroad formed by loess-type rocks according to the Project on reclamation of disturbed lands affected by the construction of railway lines, quarries and spoil dumps which would be desined by "Uzdaverloyikha" institute by December, 2014. SJSRC UTI will be responsible for implementation of actions on recultivation. Responsible persons will be specified in the developed project. Implementation monitoring will be carried out when receiving SCNP's expertise on the "Statement on environmental consequences" (SEC) with assistance of Boshtransloyikha. Recultivation of the land plots is provided according to the "Guide for recultivation planning at earth and rocky works in hydrotechnical construction". Regulation on recultivation of the land plots intended for organization of the soil dump from the ditch of the main constructions and production base sites will be accepted in the project.

Technical recultivation on all construction objects will be carried out within a year after completion of construction. Biological recultivation will provide for carrying out, after technical recultivation, of a number of actions which purpose is restoration and improvement of soil structure, and rehabilitation of its fertility. Works on planting of greenery will also refer to this type of recultivation.

At construction works it is necessary to control implementation of the requirement for environmental protection, stated in normative documents, EMF and EIA.

| Audit Findings | Recommendation |
|--|--|
| Line requiring cleaning of vegetation, rehabilitation of bridges and culverts. | It's recommended during clearing vegetation, the Contractor shall not clear any vegetation along the railway line outside of the areas defined for this purpose (10m on each side of the line), unless strictly necessary. |
| | Although vegetation can be removed mechanically, it is preferable to use manual labour, especially near the riverbanks and steep slope areas in order to avoid further erosion. |
| | No materials originating from the construction works shall be thrown into watercourses. |
| | Trees situated on the banks of rivers and streams must not be uprooted; it is recommended that they are pruned in order to adjust their shape or, if absolutely necessary, cutting the trunk at ground level. |
| Works on re-cultivation of lands at completed construction sites are not carried out | Development of land restoration actions, choice of methods of works should be done taking into account the subsequent use of lands in national economy, mining conditions of construction materials deposits, geomorphological conditions of the area, technology of mining works, economic activity and prospect of development of the raion. |
| | In view of reduction of lands used in agricultural production, at restoration of the broken territory preference should be given to re-cultivation of lands for agricultural purposes. |
| The built embankments of the railway subgrade are not stabilized. | It is recommended to sow perennial plants in the layer of fertile soil. In the absence of fertile soil layer stabilization of embankments with perennial plants should be made using hydrosowing method. Technology of works, conditions of their performance, the required amount of necessary materials are established according to the existing recommendations on stabilization of slopes of the rail road bed. |
| | The recultivated sites located on the slopes with a big area of water catchment should be protected from the drain of thawed and storm waters with mountain ditches. It is necessary to provide stabilization of the bottom and ditch slopes in easily washed out soils. |

3. Stabilization of river banks (near bridges) and embankments

The Project railroad entailed considerable earthwork to improve the alignment and conform to safety standards. The construction of new bridges entailed earthworks at

abutments and piers which also contributed to major disturbance to the earth and consequently siltation concern. Embankment filling and construction also alongside Akhangaran River was likewise considered as causes erosion and siltation.

Unfortunately, it was difficult to the group of audit to determine the correctness of the performed works on bed straightening as EIA of the construction of bridges and straightening of the rivers will be designed by Design Institute Boshtransloyiha before the completion of the main construction but all works done so far are in compliance with environmental requirements of national legislation and designed Feasibility Study.

Completed bridges at picket 141 (14 km), picket 194 (20 km) and almost completed bridge at picket 208 (21 km) and picket 855 (85 km) were considered as well.

At the same time in the section picket 194 works on protection of river banks with gabions are carried out (Photo 1). Partially the same works were carried out and are conducted in the sections picket 208 (Photo 2).





Photo 1. Strengthening of river banks by gabions. Bridge construction(km 20 – picket 194)

Photo 2. Strengthening of river banks by gabions. Bridge construction (km 21 – picket 208)

In the section of Akhangaran river with a bridge construction (20 km – picket 194) owing to obstruction of the water flows bed (Photo 3), certain change of hydrological mode is possible. In this section the speed mode of water flows during the period of high water can change. Reduction of capacity of the flood plain can lead to increase in speeds of the flows in section-lines of bridge crossings that may cause intensification of bed deformations, break of coastal zone and development of erosive processes around the bridge crossings.



Photo 3. Channel constriction of water currents

It should be noted that no garbage and construction waste detected during passing the sites.

It is visible on observed embankments that work on their onboard strengthening, establishment of borders will be carried out soon (Photo 4, 5, 6 and 7).





Photo 4. Completed bridge at picket 141 (14 km)





Photo5. Completed bridge at picket ΠK-194 (20km)



Photo6. Almost completed bridge at picket 208 (21 km)



Photo 7. Almost completed bridge at picket 855 (85 km)

The inspected embankments show that more works on their on-bank protection, delimitation will be carried out. In certain intervals culverts (Photo 8) with ditches for diversion of ground and storm waters from adjacent territories are placed. Visit of the group fell on rainy day and it was possible to observe uniform drain of storm waters by the ditches to the river through water chambers. Water chambers are also used by the livestock as tunnels for passing.









Photo 8.Culverts

The project incorporated a number of physical and engineering measures (installation of gabion walls and gabion armoring at bridge points, construction of retaining walls along embankment fills, river deflection bunds and etc) to stabilize slopes, arrest erosions and siltation in the rivers.

According to the plan the group inspected the area between south portal and Chadak. There are no works in this section yet. Group was shown only marks of the designed route.

| Audit Findings | | | | Recommendation | |
|---------------------------------|------------|-------|-----------|---|--|
| Bridges across stabilization of | Akhangaran | river | requiring | The Contractor shall ensure that slopes are re- vegetated as soon as construction of the line is completed. All steep slopes shall be smoothened and levelled to < 25% gradient. | |
| | | | | Vegetation with soil binding properties should be planted on areas where vegetation was removed | |
| | | | | All bridges and culverts shall be cleared of debris to avoid blockage and ponding. | |
| | | | | As far as is reasonably practical, the Contractor shall schedule rehabilitation activities to take place during winter when surface and subsurface water flows are lowest, plants are dormant and inundation is limited. | |
| | | | | During construction the Contractor shall make provision to maintain the natural flow of any drainage line affected by construction. | |
| | | | | The river channel embankments shall be returned to the pre-existing (or a more stable) profile than that which existed prior to construction. It's recommended that the Contractor establish a pre-construction | |

| | crossings for comparison with the site after rehabilitation. |
|--|---|
| | River embankments shall be stabilized, using any necessary protection measures, including re-vegetation, rip rap, reno mattresses ¹⁴ and other measures, to ensure that the banks are protected against erosion. The interface between the backfilled trench and the surrounding area should, as far as possible; be indiscernible, in terms of vegetation, slope and compaction. |
| | Contractor is responsible for controlling riparian and in-stream damage to the river systems through which the railway line is routed. |
| | Trees situated on the banks of rivers and streams must not be uprooted; it is recommended that they are pruned in order to adjust their shape or, if absolutely necessary, cutting the trunk at ground level. |
| | No materials originating from the construction works shall be thrown into watercourses. |
| | Debris disposal and clean up shall be carried out to return the river course to its pre-existing condition prior to the Works. |
| Construction materials spill/washed into | No equipment and construction materials |
| rivers/ canals. | snall be temporarily stored in riverbanks |
| not compacted properly | slopes, and turfing with grazing resistant native grass; |

The audit team studied the performance of construction works near the settlement Sardala. According to the project, the railway line crosses the river Akhangaran, enters the valley of Kuindy Sai (small mountain river) and on the right slope rises to the northern portal of the overpass tunnel at a mark of 1324 m. At the time of site inspection construction works were especially active. A lot of equipment and people were involved in the work at the site (Photo 9). Works included construction and consolidation of embankments, laying of railroad bed and installation of skeletons for construction of elevated part of the railway. The construction machinery and equipment is in good operating condition. No leakages of fuels and lubricants were detected at the site. The equipment and machinery which is not being used is placed at the designated concrete

¹⁴ Reno mattresses are used for river bank and scour protection, channel linings for erosion control, and embankment stability.
parking lots. The construction waste is being collected in the special metal container.





Photo 9.

The group inspected the site of placement of dump rocks from the tunnel. Placement of the excavated rocks in unauthorized volumes.

Dump rocks from the tunnel is placed in the area of the flowing Sai, being the tributary of the river Kuinda that can lead to the change of Sai bed, and also increases the risk of pollution of the water resources which are drinking source of number of settlements. For the present part of the dump rocks is transported from the places of dumps to the crushers with their use in own needs, but blockages of rocks are so big that almost the whole Sai is filled up and its bed is blocked. In this regard this aspect causes anxiety as water under blockages will start flowing in another bed and there can occur an emergency (Photo 10). At this moment, CRTG has already begun to transport dump rocks and plan to clean the Sai bed by March 2014.



Photo 10.

4. Stability of liquid waste storage near Chadak.

In the territory of liquid wastes storage of Almalyk Mining and Metallurgical Plant (AMMP) near the settlement Chadak works on protection of reservoir embankments are carried out by AMMP. Here construction, expansion and consolidation of reservoir banks are implemented (Photo 11).



Photo11. Construction, expansion and consolidation of storage banks

The engineer of DorProekt¹⁵, Mr. Azizov Siroj accompanied the group to the place of future construction of the railway near the liquid wastes storage. No construction works are being underway in this area at the moment. The axis of the road is designed approximately in 250 m from the liquid wastes storage (Photo 12). The closest point to the liquid wastes storage is indicated on the Photo 13. The level of the railroad bed is 3-4 meters below the existing level of the ground (Scheme 1).



Scheme1.

At the same time, forthcoming large-scale earthworks on construction of the embankment and associated infrastructure will require diligent supervision, especially regarding physical stability of the liquid waste lagoon of the Almalyk ore mining works.



Photo13.The closest point to the reservoir

Audit of the territory of the prospective pit intended as a source of raw materials for

 $^{^{15}}$ Design Institute of UTY, which supervise construction.

construction of the railway embankment was not carried out at this section as development of the specified territory of the pit is not started yet (Photo 14). This prospective pit is considered as reserve pit for receiving additional raw material in case the material from the main excavation is not sufficient.



Photo14.The area of the projected pit

5. Electricity supply

The JSC Sredazenergosetproyekt institute, under the subcontract agreement, prepared the feasibility study "Scheme of external power supply of traction substations" which includes electrification of traction SS of various options of the new railroad. The feasibility study "External power supply of traction substations" is part of the feasibility study for the investment project "Construction of New Electrified Railway Angren - Pap", carried out by JSC Boshtransloyikha institute on the basis of the "Decree of the President of the Republic of Uzbekistan No.PP-1985 of 18.06.2013".

The feasibility study "External power supply of traction substations" is carried out on the basis of:

- 1. Decree of the President of the Republic of Uzbekistan No.PP-1985 of 18.06.2013»
- "Schemes of external power supply of traction substations of the new electrified railway line Angren-Pap" inv.№ 3672-10-t.2 (adjustment), approved by the decision No. 1 of SJSC "Uzbekenergo" of 14.01.2013
- 3. Letters of JSC Boshtransloyikha No. 08/2093 of 08.07.13, No. 08/2752 of 04.09.13 according to which the feasibility study is carried out according to the option VI (Schemes ...) for the I option of the railway construction with overpass tunnel of 19.1 km long.
- 4. Terms of reference for development of the feasibility study approved by the institute JSC Boshtransloyikha.
- 5. Subcontract agreement No.66-13 of 17.10.2013 with the institute JSC Boshtransloyikha.
- 6. Provided technical specifications.

Commissioning of traction SS was supposed to be carried out at the stage 2020-2021 that assumed the appropriate development of 220-500kV networks of the considered region.

The Feasibility Study provides for power supply of three traction substations - Sardala TSS, Koshminor TSS, Pap TSS. Connection of TSS Sardala is carried out at 220kV

voltage with connection of 220kV transmission line (TL) Angren – Obi-Hayot to TSS. Koshminor TSS and Pap TSS are connected to 220/110/10kV SS Obi-Hayot by separate double-circuit 110kV TL. In this regard reconstruction, according to the provided technical specifications of Eastern interdistrict power plant No. 1711-4 of 02.10.2013 is envisaged at SS 220/110/10kV Obi-Hayot.

The feasibility study "Scheme of external power supply of traction substations" provides the section" Environmental protection". The expert report No. 259-e of the Committee for architecture and construction was obtained on June 10, 2014.

According to the specification for SS 220kV Obi-Hayot replacement of the existing autotransformers of 2×125MVA power with the voltage of 220/110/10kV to the new autotransformers of 2×200MVA power is provided;

SS buildings and facilities according to the standard and individual designs from the prefabricated reinforced concrete structures and items produced in the territory of the Republic of Uzbekistan are applied in the project.

Attached warehouse and substation construction facilities is supposed to arrange on the abandoned lands around SS 220kV Obi-Hayot. All freights for construction are transported by railway transport to Pap station, and then by motor transport to the attached warehouse.

Organization of ditches for foundations and trenches should be carried out according to the rules of works in compliance with the effective ShNK and KMK.

Electric installation works should be performed according to KMK 3.05.06.97 "Electrotechnical devices" and taking into account works near the operative equipment. Prior to electric installation works in open distributing devices, construction company should finish construction of access roads, ways, driveways, install tire and linear portals, build foundations for electric equipment, cable channels with coverings, fencing around switch-yard, tanks for emergency discharge of oil, underground communications and finish planning of the territory. Material provision of the object under construction, organization of transportation, warehousing and storage of materials, constructions and equipment should be carried out according to the instructions of ShNK 3.01.01-03 "Organization of construction production". Construction of the object has no scopes with difficult and undeveloped technology and does not require special equipment or devices. At works near the operative equipment and TL it is necessary to follow "Safety rules at operation of electric devices" section 23 "Access of the personnel of the construction organizations to works in the operating electric devices and in the security zone of transmission line."

All ordered equipment and its isolation should correspond to environment conditions.

Installation and construction works have no harmful technologies polluting environment. Thus the contractor should take all necessary precaution measures for prevention of damage to natural landscape when working.

As the area of the route passing is being developed for the long time, the designed TL passes, mainly, on the cultivated lands. Despite this, TL routes are chosen taking into account requirements of land users and causing the minimum damage to environment.

In order to avoid death of birds from electrical shock on the traverses of TL poles antibird obstructions are installed over each supporting garland.

Technological process of supply and distribution of energy in normal operational conditions is waste-free and does not cause harmful emissions in the surrounding air or water environment.

In cases of possible damages to TL causing accidents (falling of the pole or break of wire), no negative impacts on residential areas will exist in view of TL passing at a distance of more than pole height from the settlements.

As the whole route is mainly at considerable remoteness from the settlements, the construction machinery traffic, noise and vibration from cars will not affect health and efficiency of inhabitants.

For prevention of pollution of the whole area and uncontaminated equipment with transformer oil at substation where works on dismantle of transformers will be conducted, it is necessary to designate a so-called "dirty zone". Dismantle of transformers should be carried out only within "dirty zone". It is preferable that isolated premises are used as "dirty zone".

Desktops in the dirty zone should be covered with smooth impenetrable material with rollers at the edges for prevention of liquid spills. Floors in the dirty zone should be covered with flat impenetrable material and have dib-hole for collecting of the spilled liquid. Afterwards material for covering of tables and floors should be utilized as waste.

Works on packing of transformer oils into container for storage and further transportation, should be carried out in specially equipped platforms which should be concreted or have other water-proof temporary covering which later can be packed into the container for storage in the warehouse. Platforms should be equipped with sinks for collecting oil in case of spillage/leakage.

Transformer oil and waste, as well as warehouses, should be marked for quick effective identification and response to potential accidents connected with substances, which are dangerous to environment.

Table 1. Environmental mitigation measures for reconstruction of Obi-Hayot substation, including decommissioning writing off two transformers

| Carried out works | Expected impacts | Measures on prevention/mitigation of adverse impacts |
|--|--|---|
| Delivery of new equipment (transformer) | Exhaust gases of cars from fuel burning; | Regular checkup of motor transport; |
| to installation site | 2) Spillages of oil products; | |
| | 3) Noise impact. | |
| Oil discharge from the equipment and | 1) Formation of wastes in form of oil, the oil-filled | 1) Installation of pallet for catching of oil in case of spillage; |
| | construction wastes etc. | 2) Obtaining permission to disposal of narmiess wastes; |
| | 2) Spillage of oil and oil products is possible: | 3) Use of high-quality brands of automobile fuel for reduction of |
| | 3) Exhaust gases from burning of fuel during the | emissions; |
| | operation of the truck crane; | 4) Regular checkup of the used equipment; |
| | | 5) Environment monitoring ¹⁰ . |
| Dismantle of the used equipment: | 1) Formation and utilization of the transformer oil; | Environment monitoring |
| 1) Oil discharge from equipment | 2) Formation and utilization of solid wastes from the | |
| 2) Dismanting of equipment | ceramics other) | |
| Transportation of the old equipment from | 1) Exhaust gases from fuel burning by motor | 1) Use of high-guality brands of automobile fuel for reduction of |
| the work site | transport when transporting the equipment from | emissions: |
| | the work site; | 2) Regular checkup of motor transport. |
| | Spillages of oil products are possible; | |
| | 3) Noise impact. | |
| Demolition of old concrete supports | 1) Dust at demolition of supports | 1) Dust suppression activities; |
| | 2) Exhaust gases of the operating equipment 3) Expression of construction wastes (destroyed | 2) Use of high-quality brands of fuel; |
| | concrete metal wastes other) | 3) Regular checkup of equipment and mechanisms; |
| | 4) Spillages of oil products are possible | Obtaining permissions to disposal of wastes; |
| Construction of new concrete supports | 1) Dusting at earth works; | 1) Dust suppression activities; |
| | 2) Exhaust gases from equipment during | Use of high-quality brands of fuel; |
| | construction; | Regular checkup of motor transport. |
| Installation and connection of new | 3) Spillages of oil products are possible. | 1) Liss of high quality brands of automobile fuel for reduction of |
| equipment | equipment installation | emissions: |
| | 2) Spillages of oil products are possible; | 2) Regular checkup of equipment: |
| | 3) Leakage of sulfur hexafluoride (SF6) | 3) Installation of the nallet for catching of oil in case of spill. |
| | | 4) Provention of emissions of SE6 groophouse gest check of |
| | | 4) Frevention of entissions of SFO greenhouse gas. check of |

¹⁶ Environment Monitoring Plan in Table 2

| Carried out works | Expected impacts | Measures on prevention/mitigation of adverse impacts |
|-------------------|------------------|---|
| | | connections of the switch and drive for tightness; |
| | | 5) Measurements of insulating gas for prevention of leaks |

Table 2. Environment monitoring during reconstruction of substations

| Sphere of | Monitoring location | Parameters | Frequency | Method/ Equipment | Reporting | Responsibility |
|---------------------|--------------------------|-------------------|---------------------------|------------------------|----------------------------------|------------------------|
| monitoring | | • | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 1 |
| 1. Substations mode | rnization | | | | | |
| Atmospheric air | Equipment workplace | Control over | Prior to installation of | Measurements of | Keeping log-book of | SJSC |
| | | leakage of | the equipment it is | insulating gas will be | measurements of | «Uzbekenergo» |
| | | insulating gas | necessary to check it for | made by special | insulating gas with | SJSC |
| | | (sulfur | tightness and to make | devices | indication of the date, | «Uzbekenergo» |
| | | hexafluoride SF6) | measurements of | | time, readings and | |
| | | | insulating gas; | | the person who was | |
| | | | After installation of the | | carrying out | |
| | | | equipment it is | | measurement | |
| | | | necessary to carry out | | | |
| | | | measurements of | | | |
| | | | insulating gas | | | |
| Soil | Places of storage of the | | | Laboratory tests | 1) Sampling log- | 1) SJSC |
| | used oil and | | | | book; | «Uzbekenergo» and |
| | equipment, other | | | | 2) Protocol of | laboratories attracted |
| | production wastes | | | | sampling; | by SJSC |
| | | | | | Results of the | «Uzbekenergo»; |
| | | | | | selected samples. | 2) Laboratory for |
| | | | | | | revealing of PCD |
| | | | | | | chosen by SJSC |
| | | | | | | «Uzbekenergo» |

| Sphere of monitoring | Monitoring location | Parameters | Frequency | Method/ Equipment | Reporting | Responsibility |
|-------------------------|---------------------|--------------|--|-------------------|--|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Soil | Work sites | Oil products | During the works on replacement of the equipment; In case of leak of oil or oil products from motor transport | Laboratory tests | Protocol of soil sampling Results of the carried-out analyses of the soil | SJSC «Uzbekenergo» and laboratories attracted by SJSC «Uzbekenergo» |

6. Borrow Pits

Design Institute Boshtransloyiha has defined a number of existing and proposed borrow pits for all sections of the alignment. These are not part of the approved design since the contractor will make the final decision on the selection of borrow pits. The existing legal borrow pit have already received approval from the Rayon Hokimiyats. The contractor is responsible for maintaining any public and private access roads between the borrow pits and the construction site.

Inspected quarry (photos 15-18) and borrow pit (photos 19-22) were opened at km 35+397. This quarry site and borrow pit was identified during detailed design by Design Institute Boshtransloyiha for construction of the embankment at the section between km 35+397 and km 39 +409. By the end of the operation the site will be closed and rehabilitated in accordance with EIA of the construction of quarries which will be prepared by Boshtransloyiha.



Photo 15. Quarry



Photo 17. Access road to quarry



Photo 16. Quarry



Photo 18. Transport, working in a quarry



Photo 19. Borrow pit



Photo 20. Borrow pit





Photo 21. Transport, working in borrow Photo 22. Work in borrow pit pit

The inspected sites for the sources of materials, consisting one quarry and one borrow pit were inspected on October 27, 2014 along with the Contractor.

Borrow pit and quarry are located to serve more than one site. Borrow pit and quarry is sited far from for industrial, agricultural, residential, historic, and environmentally sensitive sites. All material from inspected borrow pit and quarry are used for embankment construction. It is also used tunnel spoil for the Road Section km 35+397 and Portal km 39 +409 for embankment construction. Spoil was spread and dried before it was used for embankments. When soil was spread on slopes for permanent disposal, it was buttressed at the toe by a retaining wall. The surface of the slope will be stabilized, as necessary, prior to seeding.

For the optimization of borrow/disposal sites and selection sites/access roads during construction stage, the following principle was followed:

Borrow site

- is located in wasteland such as sparse hills and mounds to extent possible;
- avoid basic farmland;
- avoid grass land or the debris-flow sensitive area ;
- avoid industrial and agricultural production facilities (such as houses, electricity poles, towers etc.);
- avoid sensitive areas such as scenic spots, water source protection areas etc.

Access roads

- existing rural roads are used
- avoid pass through densely populated towns/villages
- avoid sensitive areas such as scenic spots, water source protection areas etc.

It's recommended to develop a Management Plan for the borrow pit operation as soon as possible, including all planned operations, quantities, hauling arrangements and security precautions. The plan shall provide full details on environmental protection measures, especially in view of protecting local water resources and proper decommissioning the sites.

The quarry and borrow pit management plan should (i) describe the areas and depths of permissible utilization determined in the designs; (ii) identify areas for the disposal of surplus materials; (iii) include the specifications for the methods of operation, clean-up and landscaping/re-vegetation for such areas; and (iv) demonstrate how the procedures comply with Uzbek legislation and specific national guidelines regulating such activities.

7. Construction camps

The audit team visited two construction camps during site visits – one camp in the Pap raion and one camp in Akhangaran rayon, just near the Northern Portal.

Construction camp in Pap raion

The audit team visited one of the construction camps in Pap district. The main land use nearby the camp is agriculture.

The audit team visited one construction camp for inspection in the Pap raion with capacity of the camp of 60 persons. Construction workers live in habitable trailers (Photo 23). All trailers and the territory around the trailers are being cleaned on a regular basis. In all trailers four beds are installed in each trailer with bed linen provided in sufficient quantity. According to sanitary norms all sites and living/bedrooms should be equipped with the first-aid kits as it was found during audit the absence of the first-aid kits on several construction sites and camps.





Photo 23. Habitable trailers

Shower (trailer with shower compartments and washstands) is organized for bathing of workers (Photo 24). Timely cleaning is carried out in the shower. The toilet of cesspool type is organized for domestic needs of the employees (Photo 25). Drains from the shower are discharged into the cesspool, located under the trailer. Cesspools are not

concreted, of absorbing type. The site for collection of wastes into the metal boxes is organized for collecting of the accumulated domestic wastes in the territory of the camp.





Photo 23. Trailer with shower Photo 25. Toilet of cesspool type compartments and washstands

Within the territory of the camp the kitchen (Photo 26) and the dining-hall for workers are organized (Photo 27).



Photo 26. Kitchen



Photo 27. Tables and benches in the dining-hall.

There is a site for parking of construction machinery in the territory of the camp (Photo 28). In view of proximity of the municipalities (Pap and Angren) repair and maintenance of the machinery is carried out at the specialized enterprises. At the time of the inspection of the camp, no explosive, flammable and hazardous/toxic materials were stored in the premises. The required amount of fuels and lubricants is supplied to the territory of the camp on daily basis. So, warehousing of fuels and lubricants is not provided on the territory of construction sites and camps. The audit team notes the absence of the fence around the construction camp. The territory of the construction camp should be fenced.



Photo 28. Parking of construction machinery in the territory of the construction camp

Construction camp in Akhangaran raion near Northern portal

The environmental performance of this camp is good and the team did not identify any issues worth mentioning in the report.

8. Monitoring of environmental performance by regulatory authorities

According to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan "On measures for safety in the sphere of development, production, transportation, storage, realization of explosive and toxic agents" and according to the Law of the Republic of Uzbekistan "On licensing of separate types of activity", China Rail Way Tunnel Group obtained the license No. 0096 for development, production, transportation, storage and realization of explosive and toxic agents, materials and products with their application, as well as blasting agents.

Number of blasting personnel of CRTG company makes 66 people of them 40 persons - blasters, 26 masters of technical supervision.

State inspectorate "Sanoatgeokontekhnazorat" carries out in the established order planned and unplanned (in the presence of the facts testifying to violation) checks of observance by CRTG of license requirements and conditions, requests from CRTG necessary information on the issues arising during the inspections.

The following government ministries and Institutions, and other organizations have various capacities, relevant monitoring responsibilities and mandates, and are included in the summary tables that follow.

| Responsible Executor | Monitoring responsibilities and mandates | Date of performance/ Frequency | Type of performed activities |
|---|--|---|--|
| Bodies of t state fire safe control | he Works on prevention of fires, participation in development of drafts of normative legal acts in the field of fire safety, participation in the composition of the commissions on selection of sites under construction and acceptance for operation of the completed (reconstructed) objects and systems of fire safety. | Quarterly. The last check was on August 8, 2014. | Monitoring is carried out on a regular basis. Following the results of each inspection the report is prepared. |
| Ministry Internal Affairs | of Control of observance of rules of storage, use, accounting, transportation of explosive materials and the order of carrying out explosive works at the sites of the railway tunnel construction. | Quarterly. The last check was on August 23, 2014 | Results of inspections showed that following the results of the realized actions elimination of previously revealed violations of requirements of the legislation for conducting blasting works at the objects of tunnel construction and implementation of types of activity, related to them, in the sphere of use of explosive materials is provided. |
| | Regime supervision over change of spring drain and surface waters along the whole route of the tunnel and the railway "Angren- Pap", for assessment of the amount and the forecast of possible water inflows | During the whole construction period | At construction of the tunnel there is no need in organization of mode supervision of surface water. Tunnel depth much more exceeds the level of possible bottoming of underground waters. In this regard impacts of tunnel on surface water are not observed. |
| State Committee for Geology | Inspection and mapping of all available water inflows (springs, hollows) with sampling of water for determination of chemical and gas composition (radon, uranium, thorium, heavy elements). | During the whole construction period | At the stage of the tunnel route survey engineering-geological survey of 1:10000 scale where engineering-geological and hydrogeological conditions of tunnelling are reflected is executed. Materials of engineering-geological surveys are reflected in feasibility studies for construction of railway tunnel. |
| | Organization of regular supervision and mapping of elements of occurrence of beds, breaks, selection of rocks monoliths and samples of water, determination of jointing of rocks and their engineering-geological properties, determination of flows and quality of ground waters for the purpose of assessment of stability of engineering | Works, are systematically carried out by the relevant employees of CRTG. | The prepared materials in form of albums are submitted to PIU SJSRC monthly. |

| | construction in the tunnel. | | |
|---|--|---|--|
| | Face approbation of the tunnel – sampling of rocks for determination of their lithologic and petrography-mineralogical structure with topographical reference for testing of the high content of ore-bearing, radioactive and toxic elements. | During the whole construction period | Works at systematic survey of the face, walls and the arch of excavations in the process of the driving. At engineering- geological assessment of the rocks containing excavations their durability and jointing is determining, there is no need in tests of high contents of ore-forming, but these works at identification of rocks occurrence zones will be carried out. For the current period such zones are not yet revealed in excavations. Radiological service of SJSRC CSES quarterly carries out works on determination of radiation level and content of Natural Radionuclides (NRN). Results of tests in form of protocols are submitted to the PIU of SJSRC, copy to CRTG. |
| | Monitoring of radiation and environmental situation during the construction of electrified railway Angren-Pap and quarterly inspections. | | Monitoring of radiation and environmental situation was provided to PIU quarterly. |
| State Committee for Architecture and Construction | Check the project sites and checks compliance with architectural/construction norms, including environmental requirements Monitoring of borrow pits | Every two weeks | Monitoring reports are given to Contractors. |
| Ministry of Health | Monitoring of radiation and environmental situation during the construction of electrified railway Angren-Pap and quarterly inspections. | According to the developed and approved schedule, Quarterly. | Results of radiological tests are given to Contractors. |
| Sanitary Epidemiological Service of the UTY | Monitoring of radiation and environmental situation during the construction of electrified railway Angren-Pap and quarterly inspections. | According to the approved schedule of the chief physician of SJSRC and on the basis of the actions plan of the Ministry of Emergency Situations RUz | On September 22 protocols of laboratory test were submitted to SJSRC. The received indicators testify that the measured rates of gamma- radiation dose make 0,15-0,99 mk3v/hour at the norm of 2,5 mk3v/hour; the measured equivalent equilibrium volume activity of radon in the air of the working zone made 15-27 Bq/m3, at the norm of 200 Bq/m3; the content of natural radionuclides Aeff made 242-556 Bq/kg, at the norm of 1500 Bq/kg. |
| | Control of execution of the sanitary legislation, health regulations and norms, infection of lands with dumps, bacterial - parasitic and other dangerous organisms by land users. | | On September 12, 2014, the monthly schedule of carrying out laboratory inspections is developed for measurement of: a) radiation background, radon determination, identification and sampling for occurrence of radionuclides in rock debris; b) chemical composition of fracture waters for pollution by oil |

| | Sanitary inspection for soil protection. | | products and household drains of surface and underground waters; c) content of polluting substances (fats, oils, oil products etc.) in mine waters; d) sanitary household provision and catering services. |
|----------------------------------|---|--|---|
| State Committee for Nature | Monitoring of radiation and environmental situation during the construction of electrified railway Angren-Pap and quarterly | Works, are carried out by the relevant employees of SCNP | Prepared materials in form of reports are submitted to the PIU of SJSRC. |
| (SCNP) | inspections. | quarterly. | |
| () | Monitoring of pollution of natural environment objects | | |
| SI | Monitoring of radiation and environmental | Monthly | On August 21, 2014, the CRTG company prepared Actions |
| Sanoatgeocont | situation during the construction of electrified | | Plan on prevention of cases of rocks sloughing at tunnel |
| eennazorat | inspections. | | |
| | Monitoring of geological research of subsoil, safe operation in the industry, mining | | The plan of joint actions for elimination of emergency situations, poisoning of miners with gases from explosives, sloughings menacing to the life of people after drilling-and-blasting works, industrial safety and ecology at construction of tunnel is developed. |

C. ENVIRONMENTAL ACTION PLAN

1. Action Plan of Environmental Mitigation

The Action Plan (table) below highlights key issues identified by the team in the process of environmental audit. It includes both site-specific issues and actions to be taken with specific deadlines and more general issues to be taken into account by the contractors in order to improve environmental performance more broadly.

Action Plan for Environmental Mitigation

| Environmental Parameter / Issue | Environmental Action Required / Recommended Parameter / Issue | | Timing (Target | Implemented by | Supervision bv |
|--|---|---|-------------------|---|-------------------|
| | | | dates) | | ~, |
| | Actions w | ith target dates | | | |
| Dumping of spoil rocks/material from the tunnel | Solve out the issue on liquidation of embankments of the dumped rocks from the tunnel | Kuimdi sai and Akhangaran river, just near the North Portal | March 2015 | CRTG | PIU |
| Existing borrow pitsBorrow pit restoration should follow the completion of works in full compliance all applicable standards and specifications. | | Borrow pit and quarry at km 35+397. | 30 January 2015 | JSC Boshtransloyikha institute and Contractors | PIU |
| New borrow pits | Prepare a borrow pit plan ¹⁷ (the plan shall indicate the location and area of proposed pit, confirmation of volume of material to be removed, and area re-cultivation plan) | All new future borrow pits | December 2015 | JSC Boshtransloyikha institute and Contractors | PIU |
| River bed straightening | Assessment of impact of river bed straightening works on the condition of the river Akhangaran is needed (to be agreed with the State Committee for Nature Protection and State Committee for Geology ¹⁸) | river Akhangaran, especially near all new constructed bridges up till Northern Portal | December 2015 | JSC Boshtransloyikha institute and Contractors | PIU |
| Workforce camp territory | The territory of all construction camps should be fenced. | At all construction camps | January 2015 | Contractors | PIU |
| Environmental monitoring | A unified quarterly (once in three months) environmental monitoring/reporting to should be introduced to ensure adequate and timely adjustment of mitigation measures is made under the project. | Project area | March 2015 | Contractors, authorized/licensed entities | PIU |

¹⁷ It would be designed by JSC Boshtransloyikha institute before the completion of the main construction ¹⁸It would be designed by JSC Boshtransloyikha institute before the completion of the main construction

| | | Actions currently being met but need t | to be sustained thro | ughout implementation | on | |
|---------------------|---|--|---|---|---|--|
| Workfe Condit | orce Camp tions | Ensure adequate waste bins are provided at camps with regular disposal to suitable locations. Initiate regular collections and disposal of garbage from around camp sites and ensure the areas remain hygienic. Provide potable water supply at all times. | At all construction camps | During the whole construction period | Contractors | PIU |
| | Construction Waste Management | Ensure all solid wastes at works sites and yards are contained and then correctly disposed of and that oils, grease, etc from servicing activities is properly collected, contained and recycled. | In all work camps, existing construction sites | During the whole construction period | Contractors | PIU |
| site issues | Personal Health and Safety | Maintain effective operation and cleaning of sleeping, cooking, washing and toilet facilities in camps. Ensure First Aid Equipment and Medical Facilities are readily available at all times. | In all work camps, existing construction sites | During the whole construction period | Contractors | PIU |
| Construction | Increased safety monitoring, field sanitation | To guide contractors, workers apply, implement safety measures and hygiene in the field of construction works | Work camps, existing construction sites | During the whole construction period | JSC Boshtransloyikha institute and Contractors | PIU |
| Air Quality | | Prohibit the open burning of waste or materials; Subject equipment (including the pollution control devices) to regular check up to ensure they are maintained in working order; The checks will be recorded as part of environmental monitoring; Undertake regular watering/spraying of the project road, especially in the vicinity of the villages/settlements, and any roads being used for haulage of materials during the dry season. | All operating construction sites | During the whole construction period | Contractors | PIU in coordination with SCNP and its national/local agencies |
| Noise and Vibration | | Quarry operations should be limited to working hours agreed with local community; Ensure all equipment, be maintained in good | Construction sites; access roads; surrounding areas | During the whole construction period | Contractors | PIU in coordination with SCNP |

| | working order and that regular equipment maintenance will be undertaken. Execute sampling of Noise and Vibration. Sampling should be carried out in the presence of UTY staff with details of locations provided on plans and on the ground and at the times appropriate to ensure meaningful data can be obtained. | | | | and its national/local agencies |
|---------------|--|--|---|-------------|--|
| Water Quality | Avoid blockage of river, watercourses, irrigation channel by excavated soil an rocks; Keep streams, rivers and watercourses (including drains) within and adjacent to the Site free from debris and any material or waste arising from Project works, and locate spoil or material stock piles away from waterways, rivers or streams. Store hydro-carbons, petroleum products, and other chemicals in secure and impermeable containers or tanks located away from surface waters. The storage areas should be constructed with a concrete base or other forms of containment that will allow any spills to be contained and immediately cleaned up Provide the measures securing the water conservations from pollution and contamination during construction works. Provide Sanitation facilities at worksites and accommodation facilities. Equip construction work camps and site offices with sanitary latrines that do not pollute surface waters. | All operating construction sites and along Akhangaran river | During the whole construction period | Contractors | PIU in coordination with SCNP and its national/local agencies |
| Landscape and | Cleaning up of the areas along the embankment | All bridges and all | During forthcoming | Contractors | PIU |

| future visual | and bridge works to enable embankment slope | embankments in | construction | |
|---------------|--|----------------|--------------|--|
| intrusion | protection works and grassing, to physically | Pap region | | |
| | stabilize the embankment and minimize visual | | | |
| | intrusion. | | | |

Sampling Program

The extent of the impacts of environmental pollution related to surface water, ground water, air quality and noise can be determined in quantitative terms by sampling a range of related parameters. Based on these results the mitigation measures provided for in the EMP can be adjusted accordingly. The field sampling work was specified for the construction and operating period.

| | Impact | Construction | | Operating Period | | Parameter |
|---|----------------------|--------------|-----------------|------------------|-----------------|--|
| | | Frequency | During Years | Frequency | During Years | |
| 1 | Surface Water | monthly | 3 yrs | 2X/yr. | 1,3,5 | pH, TSS, BOD₅, DO, TP, Oil & grease, FC |
| 2 | Ground Water | 2X/yr | 3 yrs | 0 | Not needed | pH, TSP, As, Fe, Mn, S, Cl, FC |
| 3 | Air Quality | quarterly | 3 yrs | 2X/yr | 1,3,5 | TPM, SO ₂ , NO ₂ , CO, Dust & Soot |
| 4 | Noise & Vibration | quarterly | 3 yrs | 3X/yr | 1,3,5 | dBA |

The sampling program Summary is summarised in Table below.

The sampling follows the methodology provided in the Uzbek national standard methods for monitoring pollutants.

2. General recommendations

In addition to specific issues highlighted in the Action Plan above there are a few areas where actions need to be taken by the Contractor to enhance environmental performance as many more activities/physical works will commence in the project area soon.

Below is the list of more general recommendations:

- Provide regular training/re-training during project implementation The environmental aspect should be clarified with the people involved in the Project, consisting of the Contractor's staff, PIU and, if appropriate, other stakeholders. This will enable a shared commitment to better follow the requirements of the EIA/EMF during the execution of works. The Contractor will also get clarification on the EMF that they will draft for the Project, along with provision of capable staff who can train workers on the various aspects of environmental management for the Project.
- Ensure preparation of site-specific EMPs The Contractor should produce a more site- and work-specific environmental management plan, which can also be updated to reflect changing conditions of the site and particular work-specific issues. Appropriate specifications (quantification of works, if appropriate) will be reflected in the Contractor's contract. This will have to be verified by the assigned environmental specialist as a basis for periodic compliance checks.

Most of the environmental issues that emerged in the Project were directly related to the construction activities. The disturbances or effects to physical environment and social sector were rather short-term and would last until the completion of the Project. No major issues or impact problems were reported which warranted detailed investigation.

Also no ecological complains from the general population were registered or brought forward to the Contractors and local authorities.

Critical stages of the construction with environmental implications were mainly on earthmoving, hillside cutting, excavation and backfilling. Although structural measures were part of the civil works, the stability of certain areas has to be monitored for further actions.

Environmental Audit of Completed and On-Going Works under Angren-Pap Railway Project

Terms of Reference

Background

An Environmental Audit of works carried out previously¹⁹ under the project by the UTY and its contractors will be undertaken and its findings will be included in the final version of the EMF. Previous visits to ongoing construction sites by the team's environmental specialist indicated that there were no significant issues that would require a suspension of the works, but did identify some needed improvements. The Environmental Audit will be reviewing progress in these areas (below) and will provide specific recommendations for remedial measures. An Environmental Action Plan based on these recommendations will be prepared, agreed and included in the EMF prior to negotiations.

Scope of work

Specific issues to be covered by the audit include:

Re-cultivation of embankments. Some sections of the slopes of the constructed embankment (e.g. near Akhangaran reservoir, near Western portal of eh tunnel) contain earth material, which has not been flattened and vegetation cover has not been restored yet.

According to the information of the UTY the design for re-cultivation works is in the process of preparation. It is important that design for re-cultivation of embankments (especially with earth material) nearby water bodies is prepared and works on re-cultivation completed the soonest.

THE CONSULTANT WILL CHECK THE STATUS OF DESIGN AND SCHEDULE OF PROJECTED RE-CULTIVATION

Stabilization of river banks (near bridges etc.) The works on bridges are on-going. Depending on the river trajectory some areas/sections of the river banks are enforced by gabions. However, it should be noted (and this has been confirmed by representatives of the UTY) that further strengthening of the banks is needed to stabilize the banks.

THE CONSULTANT - JOINTLY WITH ARCHITECTURE/ENGINEERING SUPERVISION INSPECTORS WILL CHECK - COMPLIANCE OF GABION STRUCTURES WITH APPROVED DESIGN AND PLAN OF COMPLETION OF THE WORKS

Electricity supply. This component involves relocation of the power transmission line on approach to settlement Sardala, construction of two sub-stations (one- at Sardala, and the other – near Pap), and reconstruction of the existing sub-station at Obikhayot (total length of transmission lines to be built – 55 km). Construction of the sub-station at Sardala will require careful mitigation measures, given the location of the construction site near Akhangaran river. Reconstruction of the sub-station at Obikhayot involves

¹⁹ This includes both completed and on-going works which potentially have negative environmental impacts, including construction of bridges, straightening of river beds, operation of the borrow pits, re-cultivation of embankments, decommissioning of electrical equipment (i.e. transformers), etc. The audit also covers operation of the construction camps and reviews existing practices of environmental and other authorities regarding monitoring of the environmental performance of the construction.

decommissioning of two transformers (produced in 1969 and 1974) The transformers do not contain PCBs (persistent organic pollutants). The decommissioned transformers will be transported to other locations and installed/commissioned to operation. Decommissioning of the transformers involves discharge of oil from old transformers. It is recommended that specific mitigation measures are put in place to avoid oil spills during decommissioning and transport of oil to new locations.

THE CONSULTANT WILL CHECK THE MITIGATION PLAN FOR DECOMMISSIONING OF OLD TRANSFORMERS, THEIR SAFE TRANSPORTATION TO OTHER LOCATIONS AND COMMISSIONING TO OPERATION

Stability of liquid waste storage near Chadak. The railway line passes by the liquid waste lagoon of the Almalyk ore mining works. The alignment is at least 200 m away from the lagoon and the terrain is flat. No impact is expected from the works, however, it is suggested that earthmoving is done taking into consideration the proximity of the lagoon.

THE CONSULTANT WILL REVIEW THE ENVIRONMENTAL ASPECTS OF THE DESIGN, INCLUDING LOCATION OF THE ALIGNMENT, BORROW PITS, IN THE PROXIMITY OF LIQUID WASTE STORAGE NEAR CHADAK

Monitoring of environmental performance by the UTY, contractors and regulatory authorities A designated inspectors of the central office of the State Committee for Architecture and Construction and oblast offices of the Committee (Tashkent and Namangan oblast) checks the project sites on a biweekly basis and checks compliance with architectural/construction norms, including environmental requirements. Environmental specialist of the State Committee of Environmental Protection undertakes monitoring of environmental performance, including radioactivity checks, waste material sites, tree cutting, etc. once a month. Also, land slide control is being undertaken permanently (24/7) by specialists (geologists) of Angren Center of Monitoring of Land-slide Areas.

THE CONSULTANT WILL CHECK THE SCOPE OF INSPECTION CHECKS UNDERTAKEN BY SPECIALISTS OF THE State Committee for Architecture and Construction AND State Committee of Environmental Protection, AND LEVEL OF COMPLIANCE OF THE CONTRACTORS WITH RECOMMENDATIONS OF THESE INSPECTION CHECKS

The UTY provided the results of monitoring of radioactivity and water quality (drainage) in the tunnel undertaken by the Sanitary Epidemiological Service of the UTY. The data suggests no excessive levels of radioactivity have been recorded. On water quality – the analysis suggest that parameters of suspended matter exceed the norms (shafts 2, 3, the main tunnel and the safety tunnel of Pap section of the tunnel). Also, the parameters "Oil and oil products", and "Greases and oils" are exceeded: traces are found at all monitoring points of Angren and Pap sections (except shaft #3). Targeted mitigation measures should be implemented soonest to bring drainage water quality to acceptable norms/standards.

THE CONSULTANT WILL CHECK IF THE MITIGATION MEASURES TO BRING WATER QUALITY TO REQUIRED PARAMETERS ARE TAKEN BY THE CONTRACTOR

Below is the list of sites to be inspected during the environmental audit.

List of sites to be inspected under Environmental Audit

Re-cultivation of embankment

- 1. Embankments already built (nearby Akhangaran reservoir)
- 2. Embankments already built (near Western Portal of the tunnel), especially the area of embankment-river/stream towards settlement Sardala

• Special attention should be paid to water erosion-prone areas (subject to re-cultivation), existing culverts, and construction waste/debris.

River bank stabilization, Akhangaran Reservoir

- 1. River bed and water-protection zone of of Akhangaran river
- 2. Akhangaran reservoir (km 9+000 km 19+571). Pay attention to the bridge at km ..., culverts and condition of embankment
- 3. Area between Akhangaran reservoir and Northern Portal of the tunnel
 - a) Two bridges
 - b) One interchange (km 35+397)
 - c) 2-3 straightening of river bed.



4. Straightening of river bed and dumping of spoil rock/material onto the flood plain near Sardala



- 5. The area between Southern portal and Chadak (km 58+492 km 73+220)
 - a) 2-3 bridges
 - b) Large-scale earthworks on construction of embankments
 - c) Safety of liquid waste storage (Almalyk ore-mining works) near Chadak. Review of design solutions may be needed to assess whether the works may have negative impact on stability of the storage of liquid waste.



Borrow pits

Inspection of two operating borrow pits (compliance with national legislation of Uzbekistan and EMF). **Electicity Supply**

- 1. Sub-station in Obihayot
- 2. Sub-station ion Sardala

Clarify what is the stage of preparation of design. Help may be needed to formulate TOR for EIA and EMP. **Worker's safety**

- Inspection of one of the construction camps to check: environmental aspects of location and maintenance of the machinery/equipment, storage of fuel and lubricants and other hazardous materials, collection, storage and disposal of household waste, treatment and discharge of household wastewater.
- 2. Inspection on compliance with health and safety rules at workspace, including special works (licensing) with electrical equipment, operating machinery, works at height, works with explosives etc.).

Monitoring of environmental aspects of the project by the UTY, contractors and regulatory authorities

The following information on inspections/checks should be provided of the state of construction and its environmental performance should be provided by the following organizations:

- a) Inspectorate of Construction (Main office of State Inspectorate on Architectural and Construction supervision of the Republic of Uzbekistan)
- b) Inspectorate of the State Committee of Environment
- c) Inspectorate of Angren Center of Monitoring of Landslide-prone areas
- d) State Committee on Geology and Mineral Resources
- e) Sanitary and Epidemiological Station of UTY monitoring of radioactivity, water quality in the tunnel etc.

Environmental monitoring results

Air Quality

Visual observations of specialists from Design Institute Boshtransloiha²⁰ and Contractors to monitor regular water sprinkling at dusty areas with loose gravel stuff during the construction activities.

Contractors is strictly instructed by Sanitary Epidemiological Service and State Committee for Nature Protection to make sure their compliance in this context as it might create air borne diseases and become nuisance for nearby communities. Contractor is delivering positive response in this context. All this is documented in special registers, which are kept by Contractors and supervisory authority. Visual observations were also made for fitness of the vehicles to minimize the smoke emissions.

Prior to construction works workers and technical personnel are briefed on observance of the requirements of environmental protection, when performing provided by the project works.

Sampling is required quarterly (every 3 months) at 4 main bridge construction sites and 4 active works sites (10 samples/quarter). One sample within 50m of active works site and one sample at closest boundary to the community. Sampling and testing of air quality have not been regularly carried out to date as (except radiation).

Water Quality

Baseline data for the project site is not available. Water Quality is being monitored by UTY's Central Sanitary and Epidemiological station at several locations of project area. According to the approved schedule of the head physician of UTY and on the basis of the actions plan of the Ministry of Emergency Situations specialists of radiological department carry out laboratory and instrumental complex analysis of water. Samples of water are selected for the chemical analysis of the content of oil products and salts of heavy metals. According to the reports, the level of radionuclides is within the norm according to SanPin No. 0283-10.

According to the data of SJSRC CSES of September 15-16, 2014, no visual visible contaminations of environment near the settlements of Chadak at mines No. 1,2,3 and near the settlement of Sardala at mine No. 1 and at the main mine were revealed. Diversion of waste and storm waters from tunnels is organized by reinforced concrete ducts. As for laboratory tests of water sampled from Chadak Sai and aryk, located at 2 km distance from the mines No. 2 and 3 excess of maximum admissible concentration for oil products was not revealed in all samples.

<u>Noise</u>

Camp sites had been established away from the residential areas/Urban vicinities. Contractor is strictly instructed to keep their rollers, excavators, pavers, air blowers, vehicles, generators and other machinery in good condition & they have shown compliance in this context. Contractor workforce is instructed to use personal protective equipment (PPE's) like ear plugs at noise generating sites to abolish the slight effects from noise. No grievance recorded from workforce & communities along with project alignment regarding noise creating nuisance for them.

Radioactivity

²⁰ Design Institute Boshtransloiha executes field supervision

According to the information of the State Committee for Geology of the Republic of Uzbekistan (No. 06-1709 dated 17.09.13) it is impossible to determine with high precision the location and degree of radioactivity of rocks at design stage. Therefore, according to the recommendations of the State Committee for Geology of the Republic of Uzbekistan continuous monitoring of exposition dose rate (EDR) of gamma-radiation and concentration of radon in the air of the working zone of the tunnel is envisaged. (For the moment it is actually carried out by security service specialists of the Contractor - the Chinese company, protocols of analyses of EDR measurements are available in PIU SJSRC "UTY"). In case of revealing the increased parameters regional departments of the State Committee for Geology will be involved to supervision of implementation of the actions plan for stabilisation of radioactive situation. At possible opening of radioactive rocks, the Project provides for selective formation of dumps (rocks with high levels of radioactivity need to be stored separately with the subsequent burial).

In addition, analyses of the opened, drainage waters are regularly made in the working zone of the tunnel, protocols of analyses are available in PIU SJSRC "UTY. At possible revealing of the higher levels of radioactivity parameters, the Project provides for disposal of the polluted waters to the radioactive wastes landfill of JSC Navoiy MMP.

UTY's Central Sanitation and epidemiology station conducts continuous complex radiation inspection along the whole line of the railway construction. At this inspection the equivalent dose rate is measured, equivalent equilibrium volume activity of radon (EEVA) and secondary decay products (SDP) in the air of the working zone is determined, soil samples from the surface layers of rocks and grounds for protection of line posts are selected. The obtained indicators do not exceed the admissible amounts according to the SanPiN No. 0193-06.

EEVA of Radon-222 and its SDP in open working sites vary from 20 Bq/m3 to 36 Bq/m3 and do not exceed the admissible rates by the SanPiN 0193-06.

Radiometric inspections are made by the dosimeter radiometer DKS-96 M s/n No. 1179, ISP RM 1703-01M s/n No. 286659, portative gamma-spectrometer of identiFinder and radiometer of aerosols RAA-10.

Annex 7

RESULTS OF PUBLIC CONSULTATIONS WITH ALL INTERESTED PARTIES

MINUTES

from the Public Consultation on

"Pap-Angren Railway Project" project

(held on October 13-14, 2014)

Public Consultations were carried out on October 13, 2014 in Akhangaran and on October 14, 2014 in Pap. Information about Public Consultations was published on official website of SJSRC "Uzbekiston Temir Yullari" (UTY) <u>http://uzrailway.uz/rus.html?id=768</u> and in Hokimiyats. Public consultations were organized with sufficient place to sit. All attendants were recorded. Public consultations were chaired by local Hokimiya officials together with UTY Environmental Consultant. All participants were free to ask questions, give comments, express their opinions.

The public discussion was attended by local representatives:

In Akhangaran region:

Mr. Shafikov - Environmental expert of OJSC "Boshtransloyiha"

Mr. Mamadaiev – Head of Department, Inspectorate for nature protection in Tashkent region

Mrs. Egamberdieva - Head doctor, Regional department of health care

Mr. Parpiev - Head of Department, Ministry of Emergency Situations of the Republic of Uzbekistan (Akhangaran region)

Mr. Kholboev - Sanitation and epidemiology center (Akhangaran region)

Mr. Miryunusov - Akhangaran Hokimiyat, Head of District Capital construction Department

Mr. Baratov - Director, Water Consumer Association "Akhangaran Asil Mirishkari"

Mr. Abdullayev - Chairman, Fond Mahalla committee

In Pap region:

Mr. Shafikov - Environmental expert of OJSC "Boshtransloyiha"

Mr. Motoboev – Head of Department, Inspectorate for nature protection in Pap region

Mr. Islamov - Head of Department, Ministry of Emergency Situations of the Republic of Uzbekistan (Pap region)

Mr. Islamov - Sanitation and epidemiology center (Pap region)

Mr. Azimov - Specialist of national bureau of cadastre of Pap district

Mr. Mamatov - Pap Hokimiyat, Head of District Capital construction Department

Mr. Mirzatursunov - Director, Water Consumer Association "Chodak"

Mr. Kalandarov - Chairman, Kushminor Mahalla committee

The discussions focused on the EMF and EIA report project design decisions (railroad characteristics, bridges, underpasses for animals, noise and dust impacts and farm traffic, fencing etc).

Mrs. Valikhodjaeva, Environmental Consultant of UTY announced information on project that made familiar all attendees with the details on Environmental impact assessment

under Project implementation. Afterwards she requested questions (the full text of presentation is enclosed).

List of main questions and answers:

| Questions /Issues Discussed | Answer | | |
|---|--|--|--|
| General perception about the project and the awareness about the proposed project. | Most of the participants are in favor of the project and have been made aware of the proposed project through the various surveys that have taken place | | |
| Support of local people for the proposed project | The vast majority support the project. Some participants mentioned that they are ready to work on the project as unskilled laborers. | | |
| What impact will the transfer to electric traction have on the environment after its implementation? | The introduction of energy saving technology will reduce the negative impact on the environment, agriculture, production, landscape, natural flora and fauna to a minimum. The absence of the emission of diesel fuel combustion products (carbonic oxide, sulfuric anhydride, nitrogen dioxide and soot) into the atmosphere will lessen background pollution in the region, which will have a positive impact on the environment. | | |
| Is an ecological examination of the construction project done or planned? | A complex examination together with ecological examination were done by State Ecological Expertise. At this moment, UTY plans to prepare the series of documents which were identified as necessary based on the results of the State Ecological Expertise's review of the draft Environmental Impact Statement for the purposes of thorough analysis of the situation, more complete assessment of the impact on the environment and minimization of risks in this project. | | |
| How will the wastes be removed? | In the process of building and operation of the facilities, construction and household wastes will be utilized, and removal will be carried out in accordance with concluded agreement. Domestic and construction waste will be regularly collected and deposited in approved disposal sites. | | |
| What are the main risks in ecological impact? | The Project will have some minor environmental impacts, which will be both positive and negative, including: (a) soil erosion, (b) temporary effect on noise and air quality due to construction activities; (c) increased growth in the economy of the region; (d) substantial income and employment opportunities; (e) better indoor air quality; (f) better life style and improved living conditions; (g) reduced health risk, (h) development of small to medium sized enterprises, (i) reduced poverty. | | |
| How will people be informed on this project, will brochures be distributed? How will they be informed of their rights? | Project staff have made several site visits for different aspects (technical, environmental, social and resettlement); there have been meetings and consultations with local people and local government stakeholders; brochures have been distributed; and information on the project as well as these public hearings have been publicized in media | | |
| Dust from construction traffic and minor increased levels of oxides of nitrogen and sulfur from construction equipment are the primary pollutants in the construction phase. The dust will settle on trees and crops and may cause some nearby residents to suffer respiratory stress. How this impact will be | These impacts will be mitigated using water spray trucks to wet down roads, therefore requiring a fleet of specialized spray trucks. Exhaust fumes from all equipment shall meet emissions standards. During the operation phase, there will be no mobile sources of air pollution on the railway because the Project will use only electric locomotives. | | |

| mitigated? | | |
|---|---|--|
| A number of protected flora and fauna species are recorded in the project area. What kind of mitigation measures should be done for protected flora and fauna? | Mitigation measures will include (i) limiting construction traffic to selected access roads, (ii) construction site rehabilitation to previous condition, (iii) training construction workers to raise awareness of environmental protection requirements, including penalties associated with firewood collection and poaching; (iv) locating all camps outside the nature reserves; and (v) preparing a detailed management plan designed to limit site- specific impacts. | |
| Location of spoil and borrow pits | Spoil and borrow pits are sited far from industrial, agricultural, residential, historic, and ecological sites. | |
| Perceived losses from the project | According to the participants, this can be mitigated through proper compensation and assistance to the affected persons. | |
| Is this consultation useful? Comments | All respondents were of the opinion that the consultation is very useful and they expect continued consultation in the future. | |
| Will there be likely involvement of local people in the implementation of the project? | The majority of the participants mentioned that road construction as a good opportunity for the local population to be employed especially during the current financial crisis, when there is lack of jobs abroad (mainly Russia) | |
| If a group of road workers lives near your home temporarily, do you have any concerns and if so, what are they? | None of the participants expressed concern about groups of road workers temporarily living close to their houses. | |

The responses and issues raised were similar from both government officials and the villagers. Both sets welcomed the project and felt that it would contribute to the national and local economies in a number of ways. The villagers felt the railway offered good prospects for increasing trade in farm produce by allowing them to access markets further afield.

Noise produced from train movement is one of the factors as mentioned by most of the participants who are living around the railroad and railway stations. Although they become habituated with the existing noise pollution, but it indeed will increase whilst more trains will pass through the junction after the construction of railroad are completed.

None of the participants was opposed to the project.

Suggestions:

- Tree plantation should be done alongside the railway lines in such a way that there should not be any obstacles in observation of signaling and could avoid eventual accidents.
- Contractors should employ local working force during project implementation period (Construction Phase).
- There should be effective mitigation measures in order to reduce noise pollution. Tree plantation and construction of noise protection walls is suggested.
- Water could be sprayed at the construction site in order to reduce dust, particularly during the construction phase.
- Enhance environmental awareness via conducting seminars for builders and local people

Comments and suggestions received during these meetings were incorporated into the final EMF. Analysis of the results indicates that:

- i. 33% of respondents ranked land acquisition as a major concern, while 27% were concerned about increased noise levels, and 18% were concerned about vegetation destruction; and
- ii. 97% of the people were familiar with this project, mainly from Hokimiyats and word of mouth, and 95% strongly supported the project.

PHOTOS FROM PUBLIC CONSULTATION



Announcement about Public Consultation in Hokimiyat of Akhangaran region



Public Consultation in Hokimiyat of Akhangaran region





Announcement about Public Consultation in Public Consultation in Hokimiyat of Pap region Hokimiyat of Pap region

LISTS OF PUBLIC CONSULTATIONS PARTICIPANTS

Akhangaran region

| Проект «Строительство электрифицированной железнодорожн Заявление о воздействии на окружающ | юй линии Ангрен-Пап». Общественная встреча на тему «Резуль цую среду (ЗВОС) и Рамочный план природоохранных мероплия | таты Экологической Оценки проекта. тий (РППМ)» | |
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"O'ZBEKISTON TEMIR YO'LLARI"

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«ANGREN-POP ELEKTRLASHTIRILGAN TEMIR YO'L QURILISHI» LOYIHASINI AMALGA OSHIRISH GURUHI **PROJECT IMPLEMENTATION UNIT «CONSTRUCTION OF ELECTRIFIED RAILWAY LINE ANGREN-PAP**»

ГРУППА РЕАЛИЗАЦИИ ПРОЕКТА «СТРОИТЕЛЬСТВО ЭЛЕКТРИФИЦИРОВАННОЙ ЖЕЛЕЗНОДОРОЖНОЙ ЛИНИИ АНГРЕН-ПАП»

100060, Toshkent sh., T.Shevchenko ko'chasi, 7 uy, tel.: 237-89-85, fax.: 256-17-46, piu.ap@uzrailway.uz

№ ГРП А-П OT D9 10

Хокимият Папского района

B рамках реализации проекта «Строительство электрифицированной железнодорожной линии Ангрен-Пап» и проведения общественных консультаций по результатам экологической оценки проекта, Заявления о Воздействии на Окружающую Среду (ЗВОС) и Рамочного плана природоохранных мероприятий (РППМ) просим Вас оказать содействие проведении в общественных слушаний co всеми заинтересованными сторонами, которые участвуют в экологическом контроле и мониторинге проекта в ходе строительства электрифицированной железнодорожной линии Ангрен-Пап.

До проведения встречи все заинтересованные лица могут ознакомится с документами по ссылкам:

http://uzrailway.uz/uzb.html?id=752

http://uzrailway.uz/uzb.html?id=749

Направляем Вам объявление для публикации в Хокимияте, ССГ и махалинских комитетах, которые затронуты проектом.

Дата проведения: 14.10.2014

Время проведения: 10:00 - 16:00

Место проведения: Малый зал Хокимията Папского района

Количество участников: неограничено

Просим Вас распространить (наклеить) объявления в самых людных местах. Просим Вас оповестить и пригласить всех заинтересованных лиц, принять участие в общественных слушаниях.

Приложение №1. Объявление об общественных слушаниях

Ответственная: Алексеева Юлия Тел: 99871 1508883

Начальник ГРП «Ангрен-Пап»

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Н.С. Эркинов



"O'ZBEKISTON TEMIR YO'LLARI"

DAVLAT AKSIYADORLIK TEMIR YO'L KOMPANIYASI KAPITAL QURILISH DIREKSIYASI

«ANGREN-POP ELEKTRLASHTIRILGAN TEMIR YO'L QURILISHI» LOYIHASINI AMALGA OSHIRISH GURUHI PROJECT IMPLEMENTATION UNIT **«CONSTRUCTION OF ELECTRIFIED RAILWAY LINE ANGREN-PAP**»

ГРУППА РЕАЛИЗАЦИИ ПРОЕКТА «СТРОИТЕЛЬСТВО ЭЛЕКТРИФИЦИРОВАННОЙ железнодорожной линии ангрен-пап»

100060, Toshkent sh., T.Shevchenko ko'chasi, 7 uy, tel.: 237-89-85, fax.: 256-17-46, piu.ap@uzrailway.uz

№ ГРП А-П OT 69.10.

Хокимият Ахангаранского района

рамках реализации проекта «Строительство электрифицированной B железнодорожной линии Ангрен-Пап» и проведения общественных консультаций по результатам экологической оценки проекта, Заявления о Воздействии на Окружающую Среду (ЗВОС) и Рамочного плана природоохранных мероприятий (РППМ) просим Вас проведении общественных слушаний co всеми оказать содействие в заинтересованными сторонами, которые участвуют в экологическом контроле и мониторинге проекта в ходе строительства электрифицированной железнодорожной линии Ангрен-Пап.

До проведения встречи все заинтересованные лица могут ознакомится с документами по ссылкам:

http://uzrailway.uz/uzb.html?id=752

http://uzrailway.uz/uzb.html?id=749

Направляем Вам объявление для публикации в Хокимияте, ССГ и махалинских комитетах, которые затронуты проектом.

Дата проведения: 13.10.2014

Время проведения: 10:00 - 16:00

Место проведения: Малый зал Хокимията Ахангаранского района

Количество участников: неограничено

Просим Вас распространить (наклеить) объявления в самых людных местах. Просим Вас оповестить и пригласить всех заинтересованных лиц, принять участие в общественных слушаниях.

Приложение №1. Объявление об общественных слушаниях

Ответственная: Алексеева Юлия Тел: 99871 1508883

Начальник ГРП «Ангрен-Пап»

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Н.С. Эркинов