Chapter 8 Environmental Social Consideration

8.1 Environmental status

The general outline of the environmental status of the project area based on the existing EIA report and the result of the field survey is described below.

8.1.1 Air quality

Table 8.1.1-1 describes the result of annual continuous atmospheric survey in 2010 at three measurement points (residential, industrial and roadside area Figure 8.1.1-1) in Navoi City by Uzbek Hydro meteorological Institution"Uzgidromet".
The nitrogen dioxide (NO_2) concentration is 0.015～0.11 mg/m^3, higher than the maximum permissible concentration (MPC) at the maximum level, with annual average of 0.04 mg/m^3.

The pollutant concentration is diluted with change of atmospheric condition such as wind direction, so that the concentration value with a long period of time such as average annual value is lower than the value with shorter period of time like 24-hour value, 30-minute value and 10-minute value, Likewise, the ambient air quality standard is also lower for the concentration value with longer period of time.
Comparing with the 1-hour value regulated by IFC/WB EHS Guidelines shown in the table below, the 30-minute value of the nitrogen dioxide (NO_2) concentration in Navoi City described in the table is considered to satisfy the IFC/WB EHS Guideline, since the 1-hour value is even lower the 30-minute value.
In addition, annual average of NO_2 concentration satisfies the annual average value of IFC/WB EHS Guidelines.

The sulfur dioxide (SO_2) concentration is 0.001～0.009 mg/$m^{3,}$ which is well below MPC at the maximum level. This value is also considered to satisfy the standard value of IFC/WB EHS General Guideline, since the 24-hour value is even lower than the 30-minute value.

It is also predicted that nitrogen dioxide (NO_2) concentration around power plant site will become much lower, since the number of vehicles and industry plants, which is the generation source of NO_2, around the power plant site is more lower than that in Navoi City.
Therefore, the NO_2 concentration value around the power plant site is predicted to be about the same or lower as the value of residential area in Navoi City at most with conservative point of view.

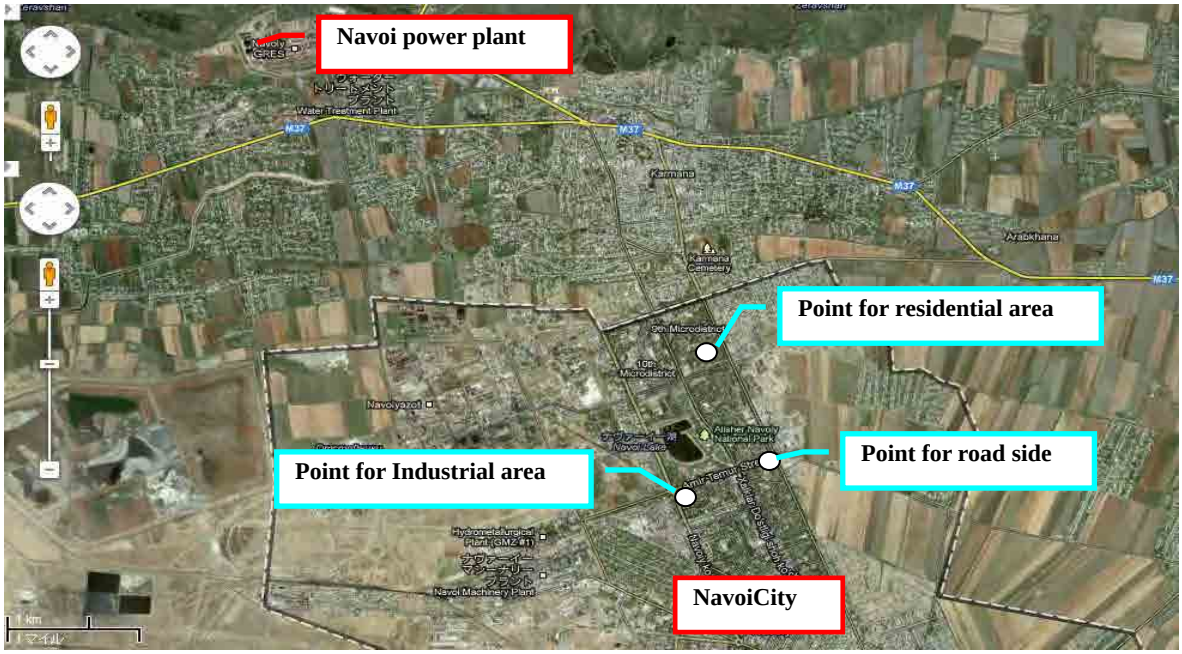

Figure 8.1.1-1 Measuring location of Air Quality in Navoi City

Table 8.1.1-1 Comparison of Air quality in Navoi city with the environmental standard

Pollutant	Area	Current value in Navoi City (mg/m^3)		Uzbekistan Maximum permissible concentration (MPC) (30 min) (mg/m^3)	IFC/WB EHS General Guidelines(2007) (mg/m^3)
		minimum ~maximum (30 min)	Annual average (1year)		
nitrogen dioxide (NO_2)	Residential	0.015～0.09	0.04	0.085	0.2(1hour) 0.04(1year)
	Industrial	0.016～0.11	0.04		
	Roadside	0.016～0.10	0.04		
nitrogen oxide (NO)	Residential	0.014～0.09	0.03	0.6	—
	Industrial	0.009～0.014	0.03		
sulfur dioxide (SO_2)	Residential	0.001～0.008	0.002	0.5	0.5(10min) 0.125(24hours)
	Industrial	0.002～0.008	0.002		
	Roadside	0.002～0.009	0.003		
carbon oxide (CO)	Residential	0.7～3.0	1.0	5.0	—
	Industrial	0.6～2.0	1.0		
Suspended particles (dust)	Residential	0.062～0.5	0.1	0.15	0.15 (24hours) 0.07 (1year)

Reference: the document by Uzbek Hydro meteorological Institution"Uzgidromet"obtained at the survey.
Sanitary norms, rules and hygiene normative documents of the Republic of Uzbekistan. San Pin No. 0015-94.

8.1.2 Water quality

1) Zerefshan River

Table 8.1.2-1 describes the result of water quality survey Zerefshan River conducted at 1 km upstream of Navoi City, 0.5km downstream of Navoi, and the water inlet of the power plant.
It should be noted that water quality of Zerefshan River in Navoi, upstream of the power plant, exceeds the MPC in SS, oil content, sulfate, heavy metals, and other items.
The inlets of the power plant are located upstream of the outlets, thus intake water is not impacted by the discharge; however, water quality of SS, oil content and sulfate exceeds the

MPC.
This water quality also exceeds the standard for a body of water for fishing activity. It is said that industrial activities in Navoi City and agriculture surrounding area are the main reason of the insufficient water quality.
Moreover, though it is not described in Table 8.1.2-1, water temperature and salinity downstream around the power plant is increasing every year, for which the existing power plant is said to be one of the pollution sources.

Table 8.1.2-1 Comparison of water quality in Zerafshan River with the environmental standard

Item	Unit	1km upstream of Navoi	0.5km downstream of Navoi	Water inlet of the power plant	Environmental standard in Uzbekistan
pH	—	7.032	6.967	8.3	6.5- 8.5
DO	mg/ℓ	10.065	9.386	—	Summer: 4.0 or higher Winter: 6.0 or higher
BOD	mgO2/ℓ	1.561	1.433	—	3.0
COD	mgO2/ℓ	11.342	16.900	—	—
SS	mg/ℓ	**349.025**	**455.364**	**487.0**	30
Oil	mg/ℓ	0.034	**0.104**	**0.212**	0.05
Ammonia	mg/ℓ	0.072	**0.165**	—	0.08
Nitrite	mg/ℓ	0.039	0.08	**0.164**	0.08
Nitrate	mg/ℓ	5.746	9.026	10.4	40
Sulfate	mg/ℓ	**516.250**	**582.455**	**453.0**	100
Phenol	mg/ℓ	0.001	**0.002**	—	0.001
Chloride	mg/ℓ	96.167	142.091	71.5	300
Calcium	mg/ℓ	97.267	105.0	107.0	180
Sodium	mg/ℓ	106.75	**127.0**	—	120
Potassium	mg/ℓ	1.667	1.845	—	50
Phosphate	mg/ℓ	**0.018**	**0.023**	—	0.01
Fe	mg/ℓ	0.054	0.084	0.33	0.5
Cu	mg/ℓ	**1.600**	**2.345**	—	0.001
Zn	mg/ℓ	**3.350**	**4.209**	—	0.01
Cr	mg/ℓ	**4.367**	**5.864**	—	0.5
Pb	mg/ℓ	**0.125**	0.00	—	0.03

Reference: EIAp23, 34-35 and the document obtained at the survey.
Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

2) Water quality of the effluent from the existing power plant

There are 5 water outlets usually used at the existing Navoi power plant and the measurement result of the pollutant concentration of water discharge from each water outlet is shown in Table 8.1.2-2.
The condenser cooling system in Unit 1~4 and Unit 7~9 of the existing power station adopts once-through system. Any pollutant will not be predicted to be generated in this system, though large amount of thermal effluent will be discharged. However, as described above, the high concentration of oil, sulfate and SS are observed in not only wastewater, but also in thermal effluent which reflects the water quality of Zerafshan River.
The condenser cooling system in Unit 11 and 12 of the existing power station adopts natural-draft system, and water is usually supplied from Zerafshan River and treated with simple precipitation system before use. As a result, concentration of pollutant in the

blow-down from the cooling tower exceeds the effluent standard in many items.
Also, water from Zerafshan river is used for the purpose of feeding the existing boiler after simple treatment; therefore, water quality of the effluent exceeds the wastewater standard.

Table 8.1.2-2 Pollutant concentration in the effluent of the existing power plant compared with the effluent standard

Items	Water outlet（mg/ℓ）					Effluent standard for Navoi power plant
	No. 1	No. 2	No. 3	No.4	No. 5	
pH	8.29		**8.7**		8.2	6.5－8.5
SS	478.0	55.4	217.4	86.6	244.5	487
Oil	**0.204**	**0.435**		**1.03**		0.112
Dissolved inorganics	1,089	1,116.2	**2,518**	-	**1,740**	1,500
Nitrite	0.156					3.3
Nitrate	9.99					45
Sulfate	438	414	**1,300**		**978**	500
Chloride	71	71	256		102	350
Calcium	102	100.8	154		202.8	487
Magnesium	83.64	76.8	**225.7**		61.24	170.1
Fe	4.58					4.62
The Maximum Discharge Volume(m^3/h)	88,000	35	97.5	5	344	—
Remark	Thermal effluent from Unit 1-10 one-through system	Rain water from Unit 8-12 after oil-treatment	Blow-down from the cooling tower of Unit 11-12	Rain water from Unit 1-7 after oil-treatment	Effluent from water demineralization facility	—

Reference: EIA p.24 and the document obtained at the survey.
Rules for protection of surface water from contamination by discharge water.(San Pin No.0056-98)

8.1.3 Noise and vibration

1) Noise

The noise level at 1km from existing power plant by brief prediction is described in Table 8.1.3-1(EIA p. 65)..
Noise level in the residential area located 1km fro the site is 54dB, which satisfies the Uzbekistan environmental standard (55dB) and IFC/WB EHS General Guidelines.
The noise measurement conducted in 2003 in the existing power plant shows that noise level which is 2-15 dB higher than the work noise standard (80dB) was observed at water-cooling tower, steam turbine, compressor, power generator, draft fans and deaerator of the power generation facility (EIA p.64-65).

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Table 8.1.3-1 Noise level at 1km from Existing power plant compared with the Uzbekistan and other environmental standards

Place	Predicted value	Standard in Uzbekistan (residential area)		IFC /WBEHS General Guidelines(2007)	
		Daytime	Nighttime	Daytime	Nighttime
1km from Existing power plant	54dB	55dB(A)	45dB(A)	55dB(A)	45dB(A)

Reference: EIA p.65
Protection from noise" (State committee of Uzbekistan for architecture and construction. Tashkent. 1996) (Norms for household construction)（KMK 2001.08-96）

2) Vibration
The survey of vibration around the power plant site has not been conducted.

8.1.4 Natural environment

1) Geography and geology
Navoi power plant site is situated in the western side of Zerafshan lowland which is a plain within the submontane district, surrounded by a flat district extending 10km.
Zerafshan lowland is gently inclined toward the east in the direction of Zerafshan River (EIA p.5, 6).

2) Geology and earthquake
The layer of the project area consists of quaternary deposit of alluvial clayey loam and sandy loam, 5m to 10m thick. A gravel layer of 20 to 25m thick lies underneath. (EIA p.36).
According to the hearing survey from the power plant official, the existing power plant has never experienced any large scale earthquakes or damages caused by earthquakes before.

According to the database of United States Geological Survey, 7 earthquakes have occurred within the 100km radius of the Navoi power plant since 1973. All of these earthquakes were below the magnitude of 5. Therefore, earthquakes that have potential to give significant impact to the power plant are not expected to occur.

Date	focal depth (km)	Magnitude	Distance from power plant (km)
8th, May, 1977	33	4.5	34
7th, Jun, 1979	33	4.3	37
29th, Mar, 1980	37	4.2	85
26th, Apr, 1980	33	4.2	88
3rd, Apr, 1984	33	4.7	68
18th, Jan, 1998	33	3.8	84
3rd, Jun, 2007	10	4.0	71

3) Meteorology
Mountainous area extends in the area 10km north, south, and east from the Navoi power plant site, and a flat land largely extends in the west side of the site. This topology influences largely the atmospheric aspect of the project site, including air current and meteorology, wind direction and speed（EIA p.6）.

a. Air temperature

The annual average temperature in Navoi is 15.87 ºC, with the lowest of 2.77 ºC in January and the highest of 28.78 ºC in July. The highest temperature ever observed is 43.8 ºC which occurred in 2007 between May and August, and the lowest temperature is -17.4 ºC (EIA p.8).

b. Precipitation

The maximum precipitation rate is observed between winter and spring, and the minimum occurs in summer. The monthly maximum precipitation is recorded in March and April, and the minimum precipitation in September （EIA p.8）

The yearly average precipitation is 205.68mm. Dense fog occasionally appears, mainly in winter, and the yearly average time of occurrence of dense fog is 41.4 hours (EIA p.8).

c. Wind direction/wind speed

As shown in Figure 8.1.4-1, the wind around the project site is mainly easterly wind (38%), or 51% including northeast wind, and the exhaust gas from Navoi power plant is blown westward, in the direction of agricultural area, which is opposite to Navoi City located in the southeast.

Pollutants in the exhaust gas may reach Navoi City in the southeast of the project site with northwest wind, but the annual average occurrence rate of northeast wind is below 8%, 14% in summer and 4% in winter (EIA p7, 8).

The average wind speed in the project area is 1.9~3.5m/s throughout the year, highest in March and lowest in September. The yearly average wind speed is 2.4m/s (EIA p7).

As frequency of wind speed, 0~1m/s is about 40%, 2~3m/s is about 40%, 4~5m/s is about 12%, and exceeding 8m/s is rare (EIA p7).

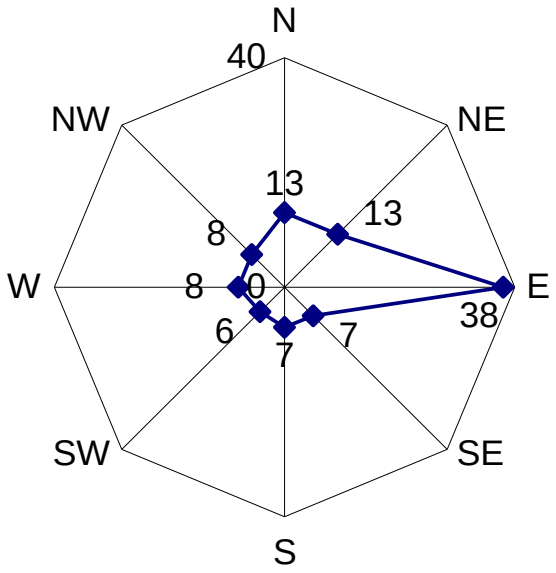


Figure 8.1.4-1 Wind rose

Reference: EIA Figure 1. p.5

4) Hydrology

a. Characteristics of Zerafshan River

Zerafshan River is 750km long, flowing from east to west. River water is taken at the maximum rate of 20m3/hour between Zaatdin Village and Navoi City to be used at 4 irrigation canals. Remaining river water flows beside Navoi power plant site into Kuyumazar water reservoir located 23km east of Bukhara (Figure 8.1.4-2) (EIA p.32).

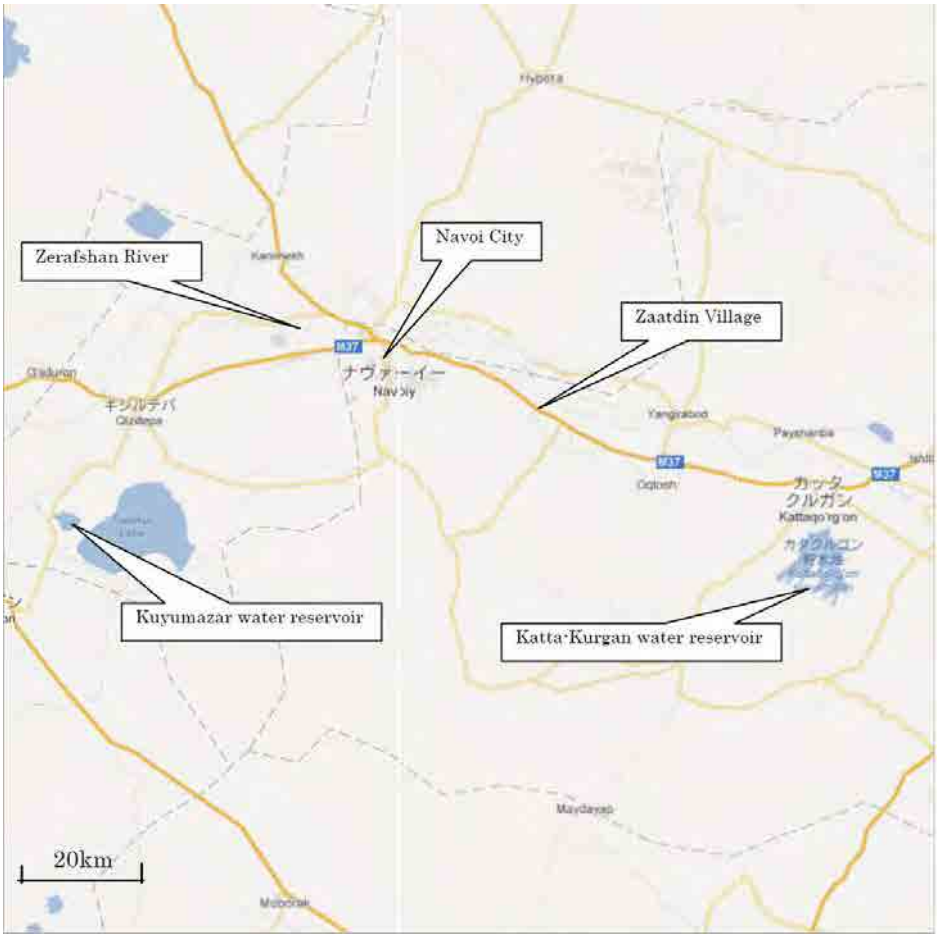


Figure 8.1.4-2 The route of Zerafshan River

b. River water temperature
The maximum water temperature of Zerafshan River in Navoi City is 24 ºC recorded in June and July. The water temperature of the effluent from the Navoi power plant at the time of discharge is 18~26 ºC, and temperature rise from the timing of water intake is 7~9 ºC (EIA p.57).

c. Flow rate
Flow rate of Zerafshan River is controlled through Katta-Kurgan water reservoir with capacity of 500 million m3constructed in 1947 (EIA p.32).
Flow rate of Zerafshan River reaches a maximum in July and August, increases between June and September, and decreases from October to May (EIA p.33).

5) Biology
a. Vegetation
The project site is adjacent to the residential area and the power plant already under influence of human activity.
According to the existing documents, in the surrounding area of the existing Navoi power plant site, Glasswort, Mulberry, Populous, Platanus, Siberian elm, Russian olive are observed. Grape and rose are grown as horticultural crop（EIA p.44）.
Precious species designated by IUCN (International Union for Conservation of Nature and Natural Resources) and by the Uzbekistan Red Data Book are not observed.

b. Terrestrial animals

According to the existing documents, in the surrounding area of the existing power plant site, reptiles including Desert Lidless Skink, Racerunner, water snake, Middle Asian tortoise, birds including Tree Sparrow, Laughing Dove, Common Starling, Common Swallow, Red-rumped Swallow, Black Swift, My-lady's-belt, Magpie, amphibians including ground toads and frogs, and mammals including mouse, mole lemming, Common Pipistrelle, Tamarisk Gerbil, Long-eared hedgehog, White-toothed Shrew are observed（EIA p.45）.

Precious species designated by IUCN (International Union for Conservation of Nature and Natural Resources) and by the Uzbekistan Red Data Book are not observed.

c.Aquatic organisms

Table 8.1.4-1 shows the list of aquatic organisms observed in Zerafshan River and the water reservoir in the basin.

30 species from 7 families of aquatic organisms are observed in Zerafshan River, of which Cyprinidae family is the largest with 19 species (EIA p.45). Most of the aquatic organisms in Zerafshan River are local species. There are several non-native species, such as *Rhinogobius* sp., Balkhash perch (*Perca schrenki*), Spotty gubach, Korean and common sawbelly (*Hemicuter leucisculus*) (EIA p.45~46).

Comparing fish species observed in Zerafshan River with IUCN List (February, 2012), 4 species are categorized as Least Concern (LC): *Leuciscus leuciscus*, *Aspius aspius*, *Silurus glanis*, and *Stizostedion lucioperca*.

Table 8.1.4-1 List of aquatic organisms in Zerafshan River and reservoir or other water body in the river shed

Species	Zarafshan r.	Water reservoirs						Lakes			Amu-Bukharskij Channel
		Akdarinskoe	Karaultepnnskoe	Kattakurganskoe	Kuyumazarskoe	Tudakulskoe	Shorkulskoe	Tuzgan (Solenoe)	Dengizkul	Karakyl	
Acipenseridae											
Spine	-	-	-	-	+	+	-	+	+	-	+
Pseudoscaphirhynchus kaufinanii	-	-	-	-	+	+	+	+	+	+	+
Cyprinidae											
Rutilus rutilus aralensis	+	-	-	-	+	+	+	+	+	+	+
Zarafshan dace (*Leuciscus leuciscus*)	+	+	-	-	-	-	-	-	-	-	-
Ctenopharyngodon idella	+	-	-	+	+	+	+	+	+	-	+
Aspius aspius taenatus nidiliodes	+	-	-	-	+	+	+	+	+	-	+
Ston morocos (Pseudorasbora)	+	+	+	+	+	+	+	+	+	-	-
Pseudogobio rivularis	+	+	-	+	-	-	-	-	-	-	-
Gudgeon	+	-	-	-	-	-	-	-	-	-	-
Khramulya (Varicorhinus)	+	+	+	-	-	-	-	-	-	+	-
Barbus capito conocephalus	+	+	-	+	+	+	+	+	+	+	+

Species	Zarafshan r.	Water reservoirs						Lakes			Amu-Bukharskij Channel
		Akdarinskoe	Karaultepmnskoe	Kattakurganskoe	Kuyumazarskoe	Tudakulskoe	Shorkulskoe	Tuzgan (Solenoe)	Dengizkul	Karakyl	
Barbus brachycephalus	-	-	-	-	+	+	-	+	+	-	+
Schizothorax intermedius	+	+	+	-	-	-	-	-	-	-	-
Chaicalburnus chalcoides aralensis	-	-	-	+	+	+	+	+	+	+	-
Alburnoides bipunctatus	+	+	+	-	-	-	-	-	-	+	-
Alburnoides taeniatus	+	+	+	-	-	-	-	-	-	+	-
Abramus brama orientalis	+	-	-	-	+	+	+	+	+	+	-
Abramis sapa	+	-	-	-	+	+	-	+	-	-	-
Capoetobrama kuschakewitschi	+	-	-	-	-	-	-	-	-	-	+
Hemicuter leucisculus	+	-	+	+	+	+	+	+	+	-	-
Iculter lucidus	+	-	+	+	+	+	+	+	+	-	-
Pelecus cultratus	-	-	-	-	+	+	-	+	+	-	+
Carassius auratus gibelio	+	+	+	+	+	+	+	+	+	+	-
Carpio	+	+	+	+	+	+	+	+	+	+	-
Hypophthalmichthys molitrix	-	+	-	+	+	+	+	+	+	-	+
Hypophthalmichthys nodilis	-	-	-	+	+	+	+	+	+	-	+
Cobitidae											
Noemacheilus strauch	+	+	-	-	-	-	-	-	-	-	-
Noemacheilus pardalis	+	-	-	-	-	-	-	-	-	-	-
Noemacheilus oxianus	+	-	-	-	+	+	-	+	+	-	+
Noemacheilus amudarjensis	+	-	-	-	-	-	-	-	-	-	+
Noemacheilus sp.	+	-	-	-	-	-	-	-	-	-	-
Barbus brachycephalus	+	-	-	-	+	-	-	-	-	-	+
Siluridae											
Silurus glanis	+	+	-	+	+	+	+	+	+	+	+
Poecelidae											
Gambusia affinis holbrockii	+	+	-	+	+	+	+	+	+	+	+
Channidae											
Channa argus warpa chowskii	+	+	-	-	-	+	+	+	+	+	+
Percidea											
Stizostedion lucioperca	+	-	-	-	+	+	+	+	+	-	-
Perca schrenki	-	-	-	+	-	-	-	-	-	-	-
Gobiidae											
Rhinogobius sp.	+	-	-	-	+	+	-	+	+	-	-
Total - Presence	30	15	9	14	24	24	17	24	23	12	15

Note: + presence
- absence
Reference ; The document obtained at the survey

8.1.5 Social environment

1) Land use

The existing Navoi power plant site is located 6km northwest of Navoi City, at an altitude of 334.2m, with the area of approximately 100ha (EIA p.5).

The land facing the north side of the site is farmland and residential area, and the south side is the residential area of Uyrot Village and the road connecting Tashkent and Bukhar. In the east side, the residential area of Michurin Village, Zerafshan River, and the road connecting Navoi and Uchkuduk are located.

The west side is a mixture of residential area and farmland of Yangiobod Village; the residential area is located up to about 2.5km from the power plant, and only farmland exists beyond that point.

The near residential area from the existing power plant site is located 650m west and 400m south west of the site.

8.2 Environmental Impact Assessment and other legal system

8.2.1 Environmental Administration and related legal system[1]

1) Environmental Administration

a. Administrative boundary

The following governmental agencies play primary roles regarding the Environmental Administration in the Republic of Uzbekistan.

- The President: Act as a decision maker on major environmental issues and also a leader to promote international cooperation on environmental conservation.
- The Diet: Clarifying the environmental conservation policies, making decision in the Diet, acting as liaison with the State Nature Conservancy council, establishing sanctuary and disaster area, developing legal systems.
- The Cabinet: Implementing environmental conservation policy, making decision and supervising operation on environmental conservation plan, and allocating natural resources.

b. Implementing Agencies

Based on the above role-sharing, the actual implementing body mainly managing the environment issue is the State Committee for Nature Protection "Goskomprirody" which was established in 1989 in the Cabinet office and is reporting to the Diet. Also as local organization of the State Committee for Nature Protection, the local Committee for Nature Protection exists in each province and major cities. State and local Committee for Nature Protection implements and manages environmental conservation.

The primary responsibilities held by the State Committee for Nature Protection are as follows.

- Legal surveillance regarding environmental conservation
- Promotion on environmental conservation plan
- Guidance on environmental tests implemented by the state
- Approval of environmental standards
- Issue and nullification of license for emission/storage of pollutant and industrial waste
- Implementation of environmental measurement
- System for international cooperation on environmental issues

Other than the State Committee for Nature Protection environmental management is conducted by Ministry of Health, Ministry of Agricultural Water Utilization under the scope of each jurisdiction respectively. Also, Sate Land Use Committee, State Forestry Committee, Uzbek Hydro meteorological Institution "Uzgidromet" are obliged to conduct environmental conservation. Monitoring on air /water quality in the general environment is actually measured by Uzbek Hydro meteorological Institution "Uzgidromet" under State Nature Conservatory Committee.

2) System of legal restriction on the environment

Laws regarding nature conservation, utilization of natural resources, environmental

[1] Republic of Uzbekistan Preparatory Survey on Tashkent Heat Supply Power Plant Modernization Project Final Report,2009

conservation are composed of act, presidential decree, legislative decree, and enactment. The legal system regarding environmental conservation is composed not only from the aspect of environmental conservation, but also from the aspects of laws regarding ecological conservation of land, water, wildlife and plant.
Followings are the Basic Laws and the established years.

- The Law of the Republic of Uzbekistan "On Nature Protection" (9 December 1992 ref, 754-XII)
- The Law of the Republic of Uzbekistan "On Water and Water Use" (6 May 1993, ref. 837-XII)
- The Law of the Republic of Uzbekistan "On Ambient Air Protection" (27 December 1996, ref. 353-I)
- The Law of the Republic of Uzbekistan "On Fauna Use and Protection" (26 December 1997, ref. 545-I)
- The Law of the Republic of Uzbekistan "On Flora Use and Protection" (26 December 1997, ref. 543-I)
- Land Code of the Republic of Uzbekistan (30 April 1998, ref. 599-I)
- The Law of the Republic of Uzbekistan "On Forest" (15 April 1999, ref. 770-I)
- The Law of the Republic of Uzbekistan "On Protection of Population and Areas from Emergency Conditions of Natural and Technogenic Character" (20 August 1999, ref. 824-I)
- The Law of the Republic of Uzbekistan "On Environmental Audit" (25 May 2000, ref. 73-II)
- The Law of the Republic of Uzbekistan "On Radiation Safety" (31 August 2000, ref. 120-II)
- he Law of the Republic of Uzbekistan "On Protection of Agricultural Plants from Pests, Diseases and Agrestals" (31 August 2000, ref. 116-II)
- The Law of the Republic of Uzbekistan "On Solid Waste Disposal" (5 April 2002, ref. 362-II)
- The Law of the Republic of Uzbekistan "On Subsoil" (new edition), (13 December 2002, ref. 444-II)
- The Law of the Republic of Uzbekistan "On Preserved Natural Territories" (3 December 2004, ref. 710-II)

The above are primary Basic Laws and there are numbers of decrees and regulations which deal with specific restrictions.

8.2.2 The EIA in Uzbekistan

1) The procedure for EIA

In Uzbekistan, in the implementation of business activities having potential environmental and human impact such as a power station project, the Environmental impact assessment (EIA) should be implemented according to the Law on Nature Preservation (enacted in December 9, 1992).
Regarding the specific procedure, according to the Resolution of the Cabinet of Ministers no. 491 on Adoption of the Environment Impact Assessment Regulations in the Republic of Uzbekistan (enacted December 31, 2001, hereinafter referred to as "Regulations No.491) .
The activity is classified into four categories (category I to IV) according to the degree of potential impact.
A thermal power plant with generation capacity of 300MW or higher is classified to category I, 100MW to 300MW into category II, and smaller than 100MW as category III, according to

"Regulations No.491)

For business activities in category I to III submission of a detailed environmental impact assessment (EIA) is required according to "Regulations No.491", the Environmental Impact Assessment should be submitted to the State Committee for Nature Protection for approval prior to the business activity having potential environmental and human impact.

a. Implementation of EIA
As determined in Section 10 of the Regulations No.491, 3 steps of EIA procedure as described below: the preliminary assessment in the planning phase; the review of the assessment; and the establishment of the final environmental standard prior to the start of the facility operation.

【Planning phase】

i. Preparation of the draft EIA
The draft EIA report should be prepared in the planning phase of the project and submitted to the State Committee for Nature Protection.

ii. Reflection of the EIA review
Following the review of the draft EIA, additional survey, in-situ investigation, special analysis, or model simulation is conducted as necessary to determine the appropriate environmental protection measures before being reviewed by the State Committee for Nature Protection for approval.
The draft environmental impact assessment report shall be reviewed within 30 days from the day of submission.

【Pre-operation phase】

Statement of Environmental Consequences should be prepared and submitted prior to the commercial operation of the project facility. This procedure is almost equivalent to the procedure of approval application in pre-operation phase in Japan.

The draft EIA for CCCGP No.2 in this project was submitted to the State Committee for Nature Protection for approval, and was turned down for amendment as a result of the review in November 11, 2011.
The main reason for rejection was that the potential environmental impact of pollutant and risk of gas explosion in view of the installation of CCCGP No.2 and shutdown of the existing Unit 1,2 and Unit 3,8 is not discussed.
The revised EIA was established and the Environmental Impact Statement was approved in February 12, 2012 after a review by the State Committee for Nature Protection.

2) Public consultation
In Uzbekistan, public meeting within the scope of the EIA procedure is not specifically regulated in the Regulations No.491
The Regulations No.491 Chapter 11 specifies that the result of the public consultation shall be described as necessary in the EIA report.
In consequence, in the power generation project in Uzbekistan, public meeting is generally held by the power generation company as part of the environmental impact assessment in case of the project in urban area such as Tashkent.
The meeting is planned and conducted by the project operator. The procedure consists of five steps:
Step 1, the notification of the meeting to the relevant people;

Step 2, the preparation of the abstract of the EIA, distribution to the relevant people, and the EIA report being made available to public inspection;
Step 3, opening the meeting with local residents;
Step 4, collection and analysis of the opinions of local residents through questionnaire; and
Step 5, report of the result of the meeting to the relevant organization.

Table 8.2.2-1 describes the basic scheme of implementation of EIA public explanation meeting.

Table 8.2.2-1 The basic scheme of implementation of EIA public meeting

Step	Contents
1	Conduct the meeting with the local administration, local residents, local community
2	Preparation of the abstract of the EIA, distribution to the relevant people, and the EIA report is made available within the power plant and the local community
3	Opening the EIA explanation meeting with local residents;
4	Collection and analysis of the opinions of local residents through questionnaire
5	Report of the result of the meeting to the relevant organization.

The meeting schedule should be widely notified using newspaper and other mass media and the relevant website.
The EIA abstract is made in Uzbek and Russian and distributed to the relevant people. It is made available to the public within the power plant and the local community. The EIA explanation meeting is an opportunity of direct session with local residents, and should be open to as many local people as possible.
The meeting should consist of the explanation of the overview of the project, including the advantage of the new facility and potential environmental impact, from the project operator, as well as Q&A sessions. After that, the questionnaire is distributed to collect the view of the local people and ensure their understanding of the project concept.
The result of the meetings is reported to the relevant organization through the summary report of the meetings published by the project operator, and publicized through the mass media.
The opinion from the local residents will be reflected in the final Statement of Environmental Consequences as described above.

8.2.3 The gap with JICA Environmental Guidelines (April 2010)

The content of the Statement of Environmental Consequences is stipulated in Chapter 11 of the Environmental Impact Assessment Regulations No.491 (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001)).
The regulation by the Environmental Impact Assessment Regulations on the content of the EIA in Uzbekistan is very simple. In this regard, the comparison was made between the content of the EIA in this project (including the actual description) with the requirement of World Bank OP 4.01 Annex B and JICA Guideline on Environmental and Social Consideration (Table 8.2.3-1).
Hereby, it is necessary to prepare for abbreviated RAP, environmental management plan and monitoring plan for both construction and operation phase.

Table 8.2.3-1 Comparison among JICA Guideline, World Bank (OP 4.01) and the EIA content in this project

Content	JICA Guideline on Environmental and Social Consideration	World Bank (OP4.01, Annex B)	The Environmental Impact Assessment Regulations (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001))	Contents of the EIA in this project	Gap between JICA Guideline and the EIA	Correspondence of this Survey Mission
Executive Summary	This concisely discusses significant findings and recommended actions.	Concisely discusses significant findings and recommended actions.	No regulations.	The important result and the outline of the activities are described as a conclusion.	There is no gap.	
Policy, legal, and administrative framework	This is the framework within which the EIA report is to be carried out.	Discusses the policy, legal, and administrative framework within which the EA is carried out. Explains the environmental requirements of any co-financiers. Identifies relevant international environmental agreements to which the country is a party.	No regulations.	Legal description as introduction.	There is no gap.	
Project Description	This describes the proposed project and its geographic, ecological, social and temporal context, including any off-site investments that may be required (e.g. dedicated pipelines, access roads, power plants, water supply, housing, or raw material and product storage facilities). It also indicates the need for any resettlement or social development plan. It normally includes a map showing the project site and the area affected by the project.	Concisely describes the proposed project and its geographic, ecological, social, and temporal context, including any offsite investments that may be required (e.g., dedicated pipelines, access roads, power plants, water supply, housing, and raw material and product storage facilities). Indicates the need for any resettlement plan or indigenous peoples development plan. Normally includes a map showing the project site and the project's area of influence.	-Equipment, materials and resources, technology used. Analysis of the fuel for environmental assessment. -The current status of the residential area, farmland, transmission line, life infrastructure.	Partial description. No description on the resettlement plan.	There is a gap.	Developing abbreviated RAP

Content	JICA Guideline on Environmental and Social Consideration	World Bank (OP4.01, Annex B)	The Environmental Impact Assessment Regulations (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001))	Contents of the EIA in this project	Gap between JICA Guideline and the EIA	Correspondence of this Survey Mission
Baseline Data	This assesses the dimensions of the study area and describes relevant physical, biological, and socio-economic conditions, including all changes anticipated to occur before the project commences. Additionally, it takes into account current and proposed development activities within the project area but not directly connected to the project. Data should be relevant to decisions about project site, design, operation, or mitigation measures, and it is necessary to indicate the accuracy, reliability, and sources of the data.	Assesses the dimensions of the study area and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences. Also takes into account current and proposed development activities within the project area but not directly connected to the project. Data should be relevant to decisions about project location, design, operation, or mitigatory measures. The section indicates the accuracy, reliability, and sources of the data.	-Environmental analysis of the environmental status, population, land development before the project installation.	Description.	There is no gap.	
Environmental Impacts	This predicts and assesses the project's likely positive and negative impacts in quantitative terms, to the extent possible. It identifies mitigation measures and any negative environmental impacts that cannot be mitigated, and explores opportunities for environmental enhancement. It identifies and estimates the	Predicts and assesses the project's likely positive and negative impacts, in quantitative terms to the extent possible. Identifies mitigation measures and any residual negative impacts that cannot be mitigated. Explores opportunities for environmental enhancement. Identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions, and specifies topics that do not require further attention.	-Technical countermeasures to mitigate and prevent negative environmental impact. -Situation analysis of negative impact in the emergency case, assessment of preventive measures. -Prediction of	No description of mitigation measures during construction. Little description on mitigation measure during operation.	There is a gap.	Developing environmental management plan and monitoring plan for construction and operation phase.

Content	JICA Guideline on Environmental and Social Consideration	World Bank (OP4.01, Annex B)	The Environmental Impact Assessment Regulations (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001))	Contents of the EIA in this project	Gap between JICA Guideline and the EIA	Correspondence of this Survey Mission
	extent and quality of available data, essential data gaps and uncertainties associated with predictions, and it specifies topics that do not require further attention.		environmental change after project installation.			
Analysis of Alternatives	This systematically compares feasible alternatives to the proposed project site, technology, design, and operation including the "without project" situation in terms of the following: the potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, it quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. It also states the basis for selecting the particular proposed project design, and offers justification for recommended emission levels and approaches to	Systematically compares feasible alternatives to the proposed project site, technology, design, and operation--including the "without project" situation--in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. For each of the alternatives, quantifies the environmental impacts to the extent possible, and attaches economic values where feasible. States the basis for selecting the particular project design proposed and justifies recommended emission levels and approaches to pollution prevention and abatement.	The analysis of the alternatives for the project plan and technical decisions regarding natural protection, in view of the latest technologies.	Description of alternative site selection.	There is no gap.	

Content	JICA Guideline on Environmental and Social Consideration	World Bank (OP4.01, Annex B)	The Environmental Impact Assessment Regulations (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001))	Contents of the EIA in this project	Gap between JICA Guideline and the EIA	Correspondence of this Survey Mission
	pollution prevention and abatement.					
(Environmental Management Plan	This describes mitigation, monitoring, and institutional measures to be taken during construction and operation in order to eliminate adverse impacts, offset them, or reduce them to acceptable levels.	Covers mitigation measures, monitoring, and institutional strengthening; see outline in OP 4.01, Annex C.	The construction plan including the environmental impact of the equipments, technologies, materials used in construction and mitigation measures.	-Little description on mitigation measure during operation phase. -No description on the environmental management plan and monitoring plan during construction and operation.	There is a gap	Developing environmental management plan and monitoring plan for construction and operation phase.
Public Consultation	This includes a record of consultation meetings (date, venue, participants, procedures, opinions of major local stakeholders and responses to them, and other items), including consultations for obtaining the informed views of the affected people, local NGOs, and regulatory agencies.	N/A (It is stated in Appendix)	No regulations. (as necessary).	Implementation of the public consultation is described in the Annex.	There is no gap.	
Appendixes	N/A	(i) List of EA report preparers --individuals and organizations. (ii) References --written materials both published and unpublished, used in study preparation. (iii) Record of interagency and	No regulations.	-Implementation of the public consultation is described in the Annex. -Description of reference document	No requirement in JICA Guidelines.	

Content	JICA Guideline on Environmental and Social Consideration	World Bank (OP4.01, Annex B)	The Environmental Impact Assessment Regulations (the Resolution of the Cabinet of Ministers no. 491 (enacted December 31, 2001))	Contents of the EIA in this project	Gap between JICA Guideline and the EIA	Correspondence of this Survey Mission
		consultation meetings, including consultations for obtaining the informed views of the affected people and local nongovernmental organizations (NGOs). The record specifies any means other than consultations (e.g., surveys) that were used to obtain the views of affected groups and local NGOs. (iv) Tables presenting the relevant data referred to or summarized in the main text. (v) List of associated reports (e.g., resettlement plan or indigenous peoples development plan).		and data for simulation/.		

8.2.4 Standards related to this project

As a major environmental regulation in `Uzbekistan, standard value / regulation air, water and noise at thermal power plant shall be described.

1) Atmosphere

a. Environmental standard

In the Republic of Uzbekistan, maximum permissible concentration (MPC) for protecting human health is established for the general/ working area.

Table 8.2.4-1 indicates MPC and classes of danger of main pollutants generated by power station emissions.

30min MPC value for NO_2 in Uzbekistan is very strict, lower than half of the 1 hour average value of IFC/WB General EHS Guidelines and EU environmental standard.

30min MPC value for SO_2 is similar to 10min value of IFC/WB EHS Guideline.

Table 8.2.4-1 Standard and Danger Class of Main Pollutants Formed by Power Stations

Pollutant	Maximum Permissible Concentration (MPC) (mg/m^3)			Danger Class*	IFC/WB EHS General Guidelines (2007) (mg/m^3)	EU environmental standard (mg/m^3)
	30min	Daily average	working area			
Nitrogen dioxide (NO_2)	0.085	0.06	5.0	2	0.2(1hour average) 0.04(yearly average)	0.2(1hour average) 0.04(yearly average)
Nitrogen oxide (NO)	0.6	0.25	-	3	—	—
Sulfur dioxide (SO_2)	0.5	0.2	10.0	3	0.5(10min) 0.125(daily average)	0.35(1hour average) 0.125(daily average) 0.02(yearly average)
Carbon oxide (CO)	5.0	4.0	20.0	4	—	—
Suspended particles （dust）	0.15	0.1	-	3	0.15（daily average)） 0.07 (yearly average)	0.05（daily average） 0.04（yearly average）

Note: ＊Class of danger is categorized as follows according to the Russian standard

1- Pollutant of extreme danger
2- Pollutant of high danger
3- pollutant of medium danger
4- pollutant of low danger

Reference: Sanitary norms, rules and hygiene normative documents of the Republic of Uzbekistan. San Pin No. 0015-94.

b. Emission standard

In the Republic of Uzbekistan, the pollutant in the exhaust gas emitted from the thermal power plant is not regulated by concentration standard of pollutant in the exhaust gas established by fuel type and generation scale, like in the IFC/WB EHS Guidelines.

Instead, ground concentration of air pollutant discharged from each stack is estimated by a designated method, and it should not exceed concentration standard value calculated from each area / danger factor shown in the Table 8.2.4-2, against the MAC shown in the Table 8.2.4-2.

Precisely, MAC for each pollutant emitted from each stack is regulated by this concentration standard. This makes it possible to increase permissible emission by lowering ground

concentration, by designing higher stack, for example, for the same scale and type of emission source.

Monitoring activity on the emission amount from each stack has been conducted at the existing power plant. It is often observed that emission amount of NO_2 from Unit 1~12 exceeds the permitted maximum emission amount, and penalty has been paid for that.

This policy of emission control by diffusion is similar to emission control policy for SOx in Japan (K value regulation).

Table 8.2.4-2 Territorial Rates for Assessment on Pollutants, Being Discharged into Atmosphere

Territorial location	Limits in MPC depending on the class of hazard of discharged pollutant			
	1	2	3	4
Provinces: Tashkent, Fergana, Andizhan, Namangan Cities: Navoi, Samarkand, Bukhara	0.17	0.20	0.25	0.33
Provinces: Bukhara, Djizak, Kashkadaria, Navoi, Samarkand, Syrdaria	0.20	0.25	0.33	0.50
The Republic of Karakalpakstan, the Khorezm province	0.25	0.33	0.50	1.00

Reference: "Instruction on Inventory of Pollution Sources and Rating the Pollutant Emission into Ambient Air for Enterprises of the Republic of Uzbekistan" (the Ministry of Justice ref. 1533.3 January 2006)

The project area corresponds to Navoi Province (out of town of Navoi City).
Standard value for maximum ground concentration of emission from each stack of Navoi power plant calculated by territorial rate of Navoi Province are shown in Table 8.2.4-3.

Table 8.2.4-3 Standard value of main pollutants maximum ground concentration (Navoi Plant)

Pollutant	MPC (mg/m^3)	Territorial rate	Standard value of maximum ground concentration (mg/m^3)	Danger Class
Nitrogen dioxide	0.085	0.25	0.021	2
Nitrogen oxide	0.6	0.33	0.20	3
Sulfur dioxide	0.5	0.33	0.063	3
Carbon oxide	5.0	0.50	2.50	4
Soot	0.15	0.33	0.050	3

Reference: "Instruction on Inventory of Pollution Sources and Rating the Pollutant Emission into Ambient Air for Enterprises of the Republic of Uzbekistan" (the Ministry of Justice ref. 1533.3 January 2006)

According to EIA (p31,46), the maximum ground concentration of NO_2 emitted from CCCGP No.2 is 14.455μg/m^3 (0.17MPC), and it is about 70% of the standard described above.

There is no regulation concerning pollutant concentration in exhaust gas in Uzbekistan. In this project, NOx concentration will be compliant to the Russian standard (GOST 29328-92) cited below. This standard value is equivalent to the guideline value for thermal power plant stipulated in IFC/WB EHS Guideline.
The result of the in-situ survey also indicates that NOx concentration in the exhaust gas from CCCGP No.1 under test-operation satisfies the Russian standard.

Table 8.2.4-4 Emission standard for exhaust gas

Pollutant	GOST 29328-92	IFC/WB EHS Guidelines for Thermal power plant (2008)
Nitrogen oxides（NOx）	51mg/Nm^3 (25ppm)	51mg/Nm^3 (25ppm)

Reference: The document obtained at the survey.

2) Water quality

a. Environmental standard

There is a water quality standard for drinking water and other water usage facilities at water withdrawal station as an environmental standard in Republic of Uzbekistan shown in Table 8.2.4-5.

Table 8.2.4-5 Environmental Standard for drinking water and water usage

Pollutant and such	**Drinking water supply**	**Non-drinking water (recreation)**
Suspended matters	Suspended matters content shall not increase on:	
	0.25 mg/ℓ	0.75 mg/ℓ
	For ponds that contain more than 30 mg/ℓ of mineral substances during low water an increase of the content of suspended matters is allowed within 5%	
	Clouds with rate of sedimentation more than 0.4 mm/s for flowing pond and more than 0.2 mm/s for reservoirs are prohibited for discharge	
Floatable impurities (substances)	Floating films, spots of mineral oils and accumulations of other impurities shall not be detected on the surface of a pond	
Smell	Water shall not obtain alien smells with intensity of not more than 1 mark (point) detected:	
	Immediately or at further chlorination (other treatment)	Immediately
coloration	Shall not be detected in the column:	
	20cm	10cm
Temperature	Summer temperature of water as a consequence of discharge of wastewater shall not increase more than 3°C comparing to the average temperature of the hottest month of a year for the last 10 years.	
Hydrogen ion index (pH)	Shall not exceed 6.5-8.5	
Mineral content	Shall not exceed 1,000 mg/ℓ of dry residue, including:Chlorides – 350 mg/l ;Sulfates – 500 mg/l	
Dissolved oxygen	Shall not be less than 4 mg/ℓ at any period of the year in a sample taken before 12:00 a.m.	
Biochemical oxygen demand	Should not exceed at 20°C:	
	3.0 mgO_2/ℓ	6.0 mgO_2/ℓ
Chemical oxygen demand	Should not exceed at 20°C:	
	15.0 mgO_2/ℓ	30.0 mgO_2/ℓ
Substances liable to cause infection	Shall not contain any	
Bacillus coli	Not more than 10,000 in ℓ (not distributed for decentralized water source)	Not more than 5,000 in ℓ
Colyfag (in plaque forming units)	Not more than 100 in ℓ (not distributed for decentralized water source)	Not more than 100 in ℓ
Teleorganic eggs of worms, cysts of Bacillus coli	Shall not contain in 1 ℓ	
Chemical substances	Shall not contain in concentrations exceeding MAC	

Reference: Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

Zerafshan River water is not used for portable water and recreation, and the MPC shown in Table 8.2.4-6 is established.

Table 8.2.4-6 Water quality standard for Zerafshan River water (MPC)

Items	Unit	MPC
pH		6.5- 8.5
DO	mg/ℓ	Summer：4.0.Winter：6.0
BOD	mgO2/ℓ	3.0
Ammonia	mg/ℓ	0.08
Nitrate	mg/l	40
Nitrite	mg/l	0.08
Phenol	mg/l	0.001
Oil	mg/l	0.05
Suspended solids (SS)	mg/l	30
Calcium	mg/l	180
Sodium	mg/l	120
Potassium	mg/l	50
Chloride	mg/l	300
Sulfate	mg/l	100
Phosphate	mg/l	0.01
Fe	mg/l	0.5
Cu	mg/l	0.001
Zn	mg/l	0.01
Cr	mg/l	0.5
Pb	mg/l	0.03

Reference: The document obtained at the survey.
Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

b. Effluent standard

Effluent from the power plant must be treated in a way so as to meet the water quality standard for water usage shown in the table above, considering the environmental impact.
The effluent standard applied to the five water outlets of the existing Navoi power plant is shown in Table 8.2.4-7.

Monitoring activity on the water quality at water outlets has been conducted at the existing power plant. It is often observed that water quality falls short of the standard, and penalty has been paid for that.

Also, the temperature rise at 500m downstream of the water outlet is regulated to be 3 ºC or lower as the Navoi power station.

Table 8.2.4-7 The effluent standard for the existing outlets of Navoi Power Plant

Items	Unit	Effluent standard for Navoi power plant	IFC/WB EHS Guidelines for Thermal power plant (2008)
pH	—	6.5－8.5	6.5－9.0
SS	mg/ℓ	487	50
Oil	mg/ℓ	0.112	10
Dissolved inorganics	mg/ℓ	1,500	—
Nitrite	mg/ℓ	3.3	—
Nitrate	mg/ℓ	45	—
Sulfate	mg/ℓ	500	—

Items	Unit	Effluent standard for Navoi power plant	IFC/WB EHS Guidelines for Thermal power plant (2008)
Chloride	mg/ℓ	350	―
Calcium	mg/ℓ	487	―
Magnesium	mg/ℓ	170.1	―
Residual chlorine	mg/ℓ	―	0.2
Total chromium	mg/ℓ	―	0.5
Copper	mg/ℓ	―	0.5
Iron	mg/ℓ	4.62	1.0
Zinc	mg/ℓ	―	1.0
Lead	mg/ℓ	―	0.5
Cadmium	mg/ℓ	―	0.1
Mercury	mg/ℓ	―	0.005
Arsenic	mg/ℓ	―	0.5

Reference:EIA p.21,p23）and the document obtained at the field survey.
Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

3) Noise and vibration

Noise standard established by the environmental standard for residential area is shown in Table 8.2.4-8. It shall not exceed 45dB during night and 55dB during daytime, which is similar to IFC/WB EHS Guidelines.

Table 8.2.4-8 Environmental standard for noise (residential area)

Category	standard in Uzbekistan		IFC EHS General Guidelines(2007)	
	daytime	Nighttime	daytime	Nighttime
Residential area	55dB(A)	45dB(A)	55dB(A)	45dB(A)

Reference: Protection from noise" (State committee of Uzbekistan for architecture and construction. Tashkent. 1996) (Norms for household construction)（KMK 2001.08-96）

In accordance with this standard, sound pressure level in the housing area for each vibration shown in Table 8.2.4-9 is established.

There is also noise standard San Pin No.0120-01 as working environment within industrial area and shall not exceed 80dB.

There is no environmental standard for vibration level.

Table 8.2.4-9 Environmental standard for noise (residential area)

Octave band (Hz)	31.5	63	125	250	500	1,000	2,000	4,000	8,000
Sound pressure level (dB)	84	67	57	49	44	40	37	35	33

Reference: Protection from noise" (State committee of Uzbekistan for architecture and construction. Tashkent. 1996) (Norms for household construction)（KMK 2001.08-96）

4) Waste

Standard for treatment of waste shall be established for all economical activities regardless of the types of industry in Republic of Uzbekistan.

Reference: RD 118,0027714.60-97 Nature protection. Treatment of waste from production and consumption.

Terms and definitions. Goskompriroda of Uzbekistan. Tashkent. 1997.

Hazardous waste is categorized into classes I to class IV: I Extreme danger, II High danger, III Medium danger, IV Low danger.
Waste generated in Navoi power plant is usually Class III and IV.

Standard value for maximum allowable amount of waste is calculated through the consumption amount of materials used from the production to the final process at the current production facilities through the most appropriate manufacturing method. Every waste material must have the following displayed; how the name of the waste material, generation source, physical /chemical characterization, danger level and production standard.
Maximum allowable storage amount is established for every waste material for standards such as on disposal amount, manufacture plan of the product, treatment of waste material and usage schedule.

Transportation of waste to disposal site or reuse is delegated to the licensed company. Final disposal is conducted at the licensed disposal facility.
The status of waste during transportation and treatment is assessed through a manifest system.
In the existing power plant, scrap metal and oil are reused by a special company, and sludge is disposed of at a designated disposal site.
Domestic waste is disposed of at a disposal site in Navoi.

Table 8.2.4-10 describes the types of waste, amount of generation and disposal situation in the existing power plant.

Table 8.2.4-10 Types, amount of generation and disposal situation of waste in the existing power plant

Description of waste	products t/y	composition of waste	Placements
Ferrous scrap	620.0	metal	Temporary storage in the territory of entity, repair workshops. The bulk of it accumulates in centralized maintenance workshop. Always supply to scrap recycling entity “Vtorchermet” in Navoi
Nonferrous scrap	10.0	Copper, aluminum	Temporary storage in the territory of electric workshop. Always supply to scrap recycling entity “Vtorchermet” in Navoi
Borings of ferrous metal	18.6	Ferrous metal	Temporary storage in special container. Always supply to scrap recycling entity “Vtorchermet” in Navoi
Waste electrodes (stubs)	1.12	Stub	Temporary storage in centralized maintenance workshop and other departments in containers. Always supply to scrap recycling entity “Vtorchermet” in Navoi
Waste transformer oil	45.0	Oil	Used oil is pouring out into oil box Part of it is used again and part of which is supplied to petroleum storage depot for recovery.
Waste engine oil	1.1	Oil	Used oil is pouring out into oil box. Part of it is used again and part of which is supplied to petroleum storage depot for recovery.
Used car tires	2.52	Rubber	Temporary storage in the territory of Vehicle Workshop. Always supply to recycling entity “Vtorsyryo”
Used accumulators	1.043	Cell jar Lead plates Electrolyte	Temporary storage in the territory of Vehicle Workshop. Always supply to recycling entity “Vtorsyryo”. Stored in tight glass tare, after sedimentation light-colored part is used for refilling of accumulators, contaminated part after neutralization is supplied to landfill for construction waste materials. Private company “Barno” in Navoi
Rags	0.5	Fabric + petroleum products (oil)	Temporary is storage in container to be burned out in boiler #3 model TGM-94.

Description of waste	products t/y	composition of waste	Placements
Oily sand	2.0	Sand contaminated by oil products	Temporary is storage in container. Is always supplied to coating plant DAEWOO "Magistral" for mixing with inert materials during asphalt production.
Oily crushed stone	6.0	Crushed stone contaminated by oil products	Temporarily is stored near transformers in concrete area. Is always is supplied to coating plant DAEWOO "Magistral" for mixing with inert materials.
Oily sludge	50.0	Sludge contaminated by oil products	Taking out for use in coating plant DAEWOO "Magistral" in asphalt production.
Slime from cleaning of turbine oil	2.5	Contaminated oil TO-22C	Send to treating facilities of industrial wastewater. Always burn out in boiler #3 model TGM-94.
Sludge from wastewater of water treatment unit	5000.0	Sludge	Temporary storage in sedimentation tanks 1 and 2 and after cleaning of sedimentation tanks is taken out to special designated place in landfill for construction waste materials – private company "Barno"
Sludge from pretreated raw water	2546.0	Sludge	After cleaning of sedimentation tanks is taken out to special designated place in landfill for construction waste materials – private company "Barno"
Mud from river water clarification	4334.5	Sand, clay	Temporary storage in sedimentation tanks and bowls of cooling tower. Then taken out to landfill for construction waste materials – private company "Barno" in Navoi
Sediment form chemical cleaning of condensers and pipes of screening system	18.0	Solid substances	Is sent to sludge remover units 1,2 (pond of vaporizer) at treating facilities of industrial wastewater where water evaporates and sediment settles and stores until filling of pond.
Waste lime	320.0	Lime, small stones	Upon accumulation is taken out in special tight vehicle to to landfill for construction waste materials – private company "Barno" in Navoi.
Wastes of process salt	68.5	Insoluble salt	Temporary storage in the territory of chemical workshop and upon accumulation is taking out to landfill for construction waste materials – private company "Barno" in Navoi
Wastes of boiler clothing	495.0	Asbestos, pasteboard, brick, cement, clay	60% of generated wastes are sent to recycling plant "Electroizolit" for recycling and the remaining parts unusable for recycling, are sent in special tight vehicle to landfill for construction waste materials – private company "Barno" in Navoi
Wastes of thermo-insulating materials	250.0	Asbestos, products of silicate cotton, diatomite	
Debris	25.0	Plaster, waste bricks and etc.	Temporary storage in the territory of repair works and sent in special tight vehicle to landfill for construction waste materials – private company "Barno" in Navoi
Waste paper	1.0	Paper	Temporary storage in special room, always take out to waste paper receiving centers.
Worn-out working cloth	3.88	Fabrics, rubber	Temporary storage in generating places, part of which is used as cleaning rags and unusable part (worn boots and shoes) sent to landfill for domestic wastes "Kizilkumkommunal-servis" PLC – Navoi
Solid domestic waste	70.6	Solid domestic waste	Temporary storage in container. Always send to landfill for domestic wastes "Kizilkumkommunal-servis" PLC – Navoi
	300.0		Temporary storage in container. Always send to landfill for domestic wastes "Kizilkumkommunal-servis" PLC – Navoi
	4.0		
Food waste	1.92	Remains of foodstuff and peel	Store in special vessel and taken out everyday for cattle feed

Reference: The document obtained at the survey.

8.3 Scoping and TOR of the survey

8.3.1 Result of the review of the EIA

1) Environmental impact assessment

a. Air quality

The project involves construction of CCCGP No.2 of 450MW and decommission of Unit 3 (150MW) and Unit 8 (160MW), which result in 140MW of increased power generation.

The EIA describes that emission of NO_2 and NO before the project implementation was 3,543 t/ y and 575 t/y respectively, and will both decrease to 3,454 t/y and 561 t/ y after the project is in operation(Table 8.3.1-1) （EIA p.60-61）

Table 8.3.1-1 Emissions of pollutants Generated from Navoi power plant

Item	Before the project (t/y)	After the project (t/y)
Nitrogen dioxide（NO_2）	3,543	3,454
Nitrogen oxide（NO）	575	561
Sulfur dioxide（SO_2）	510	911
Dust	＜1	＜1
Others	＜1	＜1
Total	5,108,797	5,302,625
Note	Unit 1and 2 decommissioned; CCCGP No.1 in operation.	Unit 3and 8 decommissioned; CCCGP No.2 in operation.

The estimated maximum ground concentration of NO_2 in the exhaust gas from the existing Navoi power plant (Unit 1~12) is 135.15μg/m^3 within 3km radius of the site, which is 1.59 times higher than MPC.

The estimated NO_2 concentration from Unit 3 and 8 which are to be decommissioned in this project is 0.79MPC (67.15μg/m^3), whereas the estimated concentration from CCCGP No.2 is 0.17MPC (14.455μg/m^3).

Consequently, this project will largely contribute to the decrease of NO_2 concentration. (EIA p.62)

b. Water quality

In this project, adoption of forced-draft cooling tower system was planned in the EIA, but forced draft air cooling system will also be considered. The amount of thermal water discharge into Zerafshan River will decrease after decommission of Unit 3 and 8 (EIA p.80).

According to the regulation in Uzbekistan, water temperature rise at 500m downstream of the water outlet shall be 3ºC or less. The estimated maximum water temperature rise by blow-down from a forced-draft system at 100m downstream of the outlet is 0.5 ºC (EIA p.57）.

Washing wastewater is generated from the water treatment system for CCCGP No.2 at the rate of 92.5m^3/h and is discharged into Zerafshan River after treatment (EIA p.55).

c. Noise and vibration

・Noise

The estimated noise level in the residential area near other project site, taking into consideration of the attenuation effect of the buildings and the green zone, will be below the

environmental standard value (EIA p.65).

・Vibration
The estimated vibration level from the power plant is less than 50dB (EIA p.65).

d. Resettlement
According to the EIA, 30 households (11 households in Uyrot village and 19 households in Yangiobod Village) will be resettled as a result of land acquisition for transmission line and road. Resettlement and decommissioning of the houses will be conducted before 15 May, 2012 (EIA p.5, Pre-Feasibility Study Appendix 7).
Total area of land needed for construction of the transmission line and road (22ha) is much larger than the plant site for CCCGP NO.2 (9ha), and the adequacy of the area for construction shall be verified promptly.

2) Environmental management plan (mitigation measures, monitoring plan)
In the EIA of this project, the following mitigation measures will be conducted during operation phase.

-Exhaust gas: the existing Unit 3 and 8 will stop operation with the operation of the power plant of this project.
-Effluent: forced-draft cooling tower system or draft air cooling system are adopted and will not generate large thermal water. Decommission of the existing Unit 3 and 8 will decrease the generation of thermal water.

There is no description of the mitigation measures during construction phase. There is no description of the monitoring plan during construction or operation phase of this project.

8.3.2 Scoping

The predicted environmental impact items and the aspect of the environmental impact is summarized in Table 8.3.2-1, according to the items cited in JICA Guidelines and based on the existing EIA review.

Table 8.3.2-1 Draft Scoping

No.	Items	Assessment				Reason for assessment (blue figure: construction period only)
		Construction phase		Operation phase		
		Positive	Negative	Positive	Negative	
【Pollution】						
1	Air pollution	N	A	B	A	- Temporary emission of air pollutants (Sox, NOx, etc) from heavy machines and vehicles and flying dust may occur, and a residential area is nearby. - In case gas is used for fuel, very little SO_2 and soot is generated. Although significant amount of NO_2 is emitted, stopping of the old power plants is also decided.
2	Water pollution	N	A	B	A	- Muddy water after rain, domestic wastewater generated by workers is temporarily generated. - Either forced draft cooling tower cooling system or forced draft air cooling system will be adopted, and large amount of thermal waste water discharge is not predicted. Stopping of Unit 3 and 8 will also diminish the thermal waste water. - Forced draft cooling tower will generate cooling tower blow-down. - Plant waste water and oily waste water is generated but stopping of the existing facilities is also decided. - Domestic waste water will be generated by project workers.
3	Waste	N	B	B	B	- Domestic waste, waste oil, waste material will be generated. - Waste oil from the equipment and oil-separating system of the waste-water treatment system and sludge from the precipitation system of the waste-water treatment system will be generated, but may be diminished after stopping of the existing facilities. - Domestic waste is generated from the project establishment.
4	Noise/vibration	N	A	N	A	- Temporary noise from the construction machines and vehicles will be generated. There is a residential area nearby. - Noise from cooling tower fan is predicted. Turbines and pumps may also be potential noise source. Residential area is nearby.
5	Subsidence	N	N	N	N	- No pumping of ground water.
6	Odor	N	N	N	N	- Materials generating bad smell will not be used during construction and operation phase.
【Natural environment】						
1	River water	N	N	B	N	- No pumping of river water. - Either forced draft cooling tower cooling system or forced draft air cooling system will be adopted, and intake of cooling water from the river is not necessary. - Less amount of river water will be taken compared to the old Unit 3 and 8 which used river water for cooling system.

No.	Items	Assessment				Reason for assessment (blue figure: construction period only)
		Construction phase		Operation phase		
		Positive	Negative	Positive	Negative	
2	ground water	N	N	N	N	- No pumping of ground water.
3	Protected area	N	N	N	N	- The project site does not include protected area.
4	Terretrial ecosystem	N	B	N	B	- Air pollution and noise during construction may have temporary impact on terrestrial organisms. ・The project site is adjacent to the residential area and the power plant already under influence of human activity.
5	River ecosystem	N	B	B	B	- Water turbidity caused by construction work may have temporary impact on river organisms. - Either forced draft cooling tower cooling system or forced draft air cooling system will be adopted, and large amount of thermal waste water discharge is not predicted. Stopping of Unit 3 and 8 will also diminish the thermal waste water. - Forced draft cooling tower will generate cooling tower blow-down. - Plant waste water and oily waste water is generated but stopping of the existing facilities is also decided. - Domestic waste water will be generated by project workers.
6	Precious species	N	B	N	B	- The project site is adjacent to the residential area and the power plant already under influence of human activity. No precious species are observed.
【Social environment】						
1	resettlement	A	A	A	A	- Land acquisition of 22ha for construction of transmission line and road will result in resettlement of 33 households.
2	Employment and livelihood	B	B	B	B	- The new employment and new business in the local area may increase the income of the local people in the surrounding area. - Income gap between the project workers and the local people may occur.
3	Local society	B	B	B	B	-Increased employment and new business will enhance the development of the local economy. - Influx of workers may generate infectious disease, HIV, conflict with local people, income gap. - Influx of workers and their family may require establishment of social infrastructure such as medical facility, schools, road, sewage line, etc. - Construction work will cause increased traffic in the road in the surrounding area, which may cause increased risk of traffic accident. - Increased traffic may damage the road in the surrounding area.
4	Cultural heritage	N	N	N	N	- No archeological, historical, cultural, and religious heritage site exists within the site.
5	Landscape	N	N	N	N	- The project site is adjacent to the residential area and the power plant with much human activity and is not a significant landscape area.
6	Minorities	N	N	N	N	- The project site is adjacent to the residential area and the power plant with much human activity and not an area for minorities to live in groups.

No.	Items	Assessment				Reason for assessment (blue figure: construction period only)
		Construction phase		Operation phase		
		Positive	Negative	Positive	Negative	
7	Labor environment	B	B	B	B	- There is a risk of labor accident of workers. - There is a risk that security agents threat the security of the local people.
【Others】						
1	Global warming	N	B	B	N	- Temporary emission of CO_2 rom heavy machines and vehicles. - The reduction of CO_2 emission concerning this project is more than 684,150 tons per year.

Notes: The categorization criteria is as follows.
A: causes serious impact.
B: causes certain degree of impact.

The result of the scoping described above and the items that need additional survey are listed in Table 8.3.2-2.

Table 8.3.2-2 The result of the scoping described above and the items that need additional survey

category	item	Construction phase	Operation phase	Additional survey item
Items that will potentially receive negative impact	Items that will potentially receive serious impact	【pollution mitigation】 - Air pollution - Water pollution - Noise and vibration 【social environment】 - resettlement	【pollution mitigation】 - Air pollution - Water pollution - Noise and vibration	- Simulation of air quality and noise during construction and operation phase shall be conducted as necessary. - Environmental management plan for air pollution, water pollution, noise and vibration and others during construction and operation phase shall be established. - Resettlement plan shall be developed based on the survey.
	Items that will potentially receive certain degree of impact	【pollution mitigation】 - Waste 【natural environment】 - Terrestrial ecosystem - River ecosystem - Precious species 【social environment】 -Employment and livelihood - Working environment	pollution mitigation】 - waste 【natural environment】 - Terrestrial ecosystem - River ecosystem - Precious species 【social environment】 -Employment and livelihood - Working environment	- Environmental management plan for waste during construction and operation phase shall be established. - Environmental management plan for ecosystem, employment and livelihood, local community, working environment during construction and operation phase shall be established.

category	item	Construction phase	Operation phase	Additional survey item
Items that will potentially receive little impact		【pollution mitigation】 - Land sinking - Odor 【natural environment】 - River water - Ground water - Protected area 【social environment】 - Cultural site - Minorities	【pollution mitigation】 - Land sinking - Odor 【natural environment】 - River water - Ground water - Protected area 【social environment】 - Cultural site - Minorities	—

8.3.3 TOR of the survey

1) Review of the existing documents

The environmental management plan (mitigation measure, monitoring) of air pollution, water turbidity, waste, noise and other pollution during construction and operation phase shall be confirmed based on the IFC/WB EHS General Guidelines.

Air pollution and noise have direct impact on the households in the surrounding area and the estimation shall be carefully considered. In this regard, in addition to the review of the prediction of air pollution and noise, simulation shall be conducted as necessary regarding construction and operation phase.

Impact assessment of air and water pollution shall be comprehensively evaluated, considering positive impact by decommissioning the existing Unit 3 and 8, and negative impact by newly constructing CCCGP No.2.

2) Major check points to the project owner

- Predicted data of air pollutants emitted from the power plant (including the existing facility) shall be confirmed and its adequacy shall be considered.
- Prediction data of noise source concerning the power plant shall be confirmed and its adequacy shall be considered.
- The flow balance of water intake of the power plant (including the existing facility) shall be confirmed.
- Measurement data of air quality, water quality, noise, ecosystem cited in the EIA shall be obtained.
- Laws and regulations currently not available shall be obtained (revised laws of labor safety, EIA-related regulations).

3) Development of the environmental management plan/monitoring plan and determination of cost, funding, and implementation system

There is almost no description about “the environmental management plan” and “the monitoring plan “in the EIA.

Consequently, appropriate plans shall be established respectively and the contents, implementation structure and budget shall be discussed with the project operator.

4) Point to be confirmed by the relevant regulating authorities

The EIA contents shall be compared with the laws and regulations of Uzbekistan concerning environmental assessment, JICA Environmental Guidelines and WB Safeguard Policy OP4.01, Annex B to determine the deviation. The supplementary EIA shall be compiled based on the result. The project owner and the related authorities shall check the contents and discuss the information disclosure and the implementation of the stakeholder’s meeting.

5) Confirmation of the resettlement status of the residents

Support for the preparation of a brief resettlement action plan shall be conducted fundamentally based on JICA Guidelines.

a. Analysis of the legal framework concerning land acquisition and resettlement
b. Necessity of land acquisition and resettlement
c. Implementation of socioeconomic survey (population census survey, property/estate survey, household finance/life survey) concerning land acquisition
   - Population census survey
     (subject): all the occupants in the proposed project site
     (content): confirmation of number of the local people entitled to compensation or livelihood restoration measure (including land owner, tenant, merchant, shop worker, illegal occupant). Their intension for the resettling site shall also be investigated.
     (note): in order to minimize the issue of the residents moved into the site after the cut-off date, the cut-off date shall be announced in principle on the starting day of the survey, and the people moved in after that shall not be granted for compensation or livelihood restoration measure.
   - survey of land and asset
     (subject): assets of all the occupants within the proposed project site
     (content): confirmation of the items and quantity of the assets physically or economically affected by the project.

   - Household finance/life survey
     (subject): at least 20% of the occupants within the proposed project site
     (content): the typical characteristics of the households entitled to compensation. Basic data regarding their livelihood and living standard. The survey should cover and confirm the living status of social minorities, the people below the poverty level, people possessing no land, indigenous or minority people, and the people not protected under Uzbekistan legal system.

d. Requirement of compensation for lost assets and livelihood restoration
   - Compensation of lost assets
   - Livelihood restoration
e. Consideration of grievance system
f. Consideration of implementation system
g. Consideration of implementation schedule
h. Consideration of Cost and funding
i. Consideration of the monitoring system/monitoring form
j. Confirmation of consultation with the affected people

However, as there is a description in the EIA that 30 households will be resettled as a result of land acquisition for constructing transmission line and road, and there is also information that resettlement and decommissioning of houses will be carried out by 15 May 2012, the status of procedure in Uzbekistan concerning land acquisition and resettlement should be confirmed. If public meeting for explaining compensation has already been held and resettlement and compensation has already started, the current status should be checked, including the implementation status of public consultation, comments from local people, details of compensation and livelihood restoration method, current status of resettlement and compensation.

6) Data collection concerning climate change countermeasure
- Collection of data necessary for quantitative understanding of greenhouse gas suppression effect (data characteristics and data collection based on CDM methodology etc).
- Estimation of greenhouse gas reduction effect (based on CDM methodology).

8.4 The result of survey

8.4.1 Re-assessment of the prediction

In order to predict the impact of the project on air quality during operation phase, the accumulative impact of the total power plant was predicted and assessed, taking into account the estimation of emission and the shutting down of the existing facilities.
A quantitative prediction and re-assessment was conducted to estimate the impact of noise and vibration during construction and operation phase.
The prediction and assessment of water pollution during operation phase was conducted taking into account decommission of the existing facility and the reduction of effluent.

1) Air pollution
a. Operation phase

Emission data of exhaust gas from the power plant described in the EIA does not appropriately take into account the heat supply of CCCGP No.2, however, it does consider the existing Unit 6 and 10 as “not operating”, in addition to Unit 1,2 and Unit 3,8.
In this regard, review of pollutant emission was conducted under the condition that Unit 6 and Unit 10 are in operation and heat supply of CCCGP No.2 is included.

Also, used gas fuel in CCCGP No.2 contained almost no sulfur in result of review, whereas gas fuel containing 0.03% sulfur was used in the EIA.

Moreover, in the EIA, exhaust gas temperature was set as high as 126 ºC to minimize corrosion by sulfer. In the result of the review, as the gas turbine containing little sulfur is used, gas temperature is set to 100 ºC.

Table 8.4.1-1 describes emission data from each stack of power plant specified in EIA report as well as the result of this review.

Emission amount of NO_2 from CCCGP No.2 increases about 1.7 times, from 18.3g/s to 32.5g/s; therefore, the maximum ground concentration of NO_2 will also be expected to become higher than the value specified in EIA report for CCCGP No.2, which is 14.455μg/m^3 (0.17MPC) by the method used in Uzbekistan.
The maximum ground concentration standard from CCCGP No.2 stipulated by regulation in Uzbekistan is 21μg/m^3 (0.25MPC).
The permitted maximum emission volume from CCCGP No.2 becomes 26.6g/s, calculating with the standard of ground-level concentration. The emission volume, according to the result of this survey mission, however becomes 32.5g/s, which exceeds the permitted emission volume.

Therefore, prediction on the impact caused by NO_2 emission was conducted using emission gas data. The prediction was conducted using gaussian plume model. This model is used in the US and Japan, but is different from the method used in Uzbekistan, and the final check by the Uzbekistan side shall be conducted until future operation.

Table 8.4.1-1(1) Emission data from stack of power plant (EIA)

Items	Unit	Existing units				Gas-combined	
		Stack2	Stack 3	Stack4	Stack 5	CCCGP No.1	CCCGP No.2 (this project)
		Unit 3, 4	Unit 5, 6, 7	Unit 8,9,10	Unit 11, 12		
Emission volume (wet)	m^3/s	501.0	397.1	646.8	700.9	691.2	736.1
Exhaust gas temperature	°C	142	136	141	150	126	126
Exhaust gas speed	m/s	7.6	6	9.8	24.8	12.2	13.0
Stack height	m	56	56	56	180	60	60
NO_2. emission	g/s	29.1	28.4	47.2	94.1	17.2	18.3
NO. emission	g/s	4.7	4.6	7.7	15.3	2.8	2.9
SO_2. emission	g/s	2.4	3.1	7.2	1.0	15.6	16.6
NO_2.concentration	mg/m^3	58.1	71.4	73.0	134.3	24.8	24.8
NO. concentration	mg/m^3	9.4	11.6	11.9	21.8	4.0	4.0
SO_2. concentration	mg/m^3	4.8	7.8	11.1	1.4	22.5	22.5

Note: concentration of pollutants is actual base in the exhaust gas.

Table 8.4.1-1(2) Emission data from stack of power plant (Result of Review)

Item	Unit	Existing units				Gas-combined	
		Stack2	Stack 3	Stack4	Stack 5	CCCGP No.1	CCCGP No.2. (this project)
		Unit 3, 4	Unit 5, 6, 7	Unit 8,9,10	Unit 11, 12		
Emission volume (wet)	m^3/s	**500.2**	**596.1**	**863.2**	700.9	**847.6**	**783.4**
Exhaust gas temperature	°C	142	136	141	150	126	**100**
Exhaust gas speed	m/s	**9.5**	**9**	**8.1**	24.8	**14.9**	13.8
Stack height	m	56	56	56	180	60	60
NO_2. emission	g/s	29.1	**42.6**	**81.4**	94.1	**28.9**	**32.5**
NO. emission	g/s	4.7	**6.9**	**13.2**	15.3	**4.7**	**5.3**
SO_2. emission	g/s	2.4	**4.6**	**12.4**	1.0	**36.5**	**0.9**
NO_2.concentration	mg/m^3	58.1	71.4	**94.3**	134.3	**34.1**	**41.5**
NO. concentration	mg/m^3	9.4	11.6	**15.3**	21.8	**5.5**	**6.7**
SO_2. concentration	mg/m^3	4.8	7.8	**14.4**	1.4	**43.0**	**1.2**

Note: bold letter: changed value from EIA report (Appendix 3).

【Atmospheric diffusion estimation model】

Using the following Gaussian diffusion model, 30-min value estimation was conducted according to the time scale in conformity to the ambient air quality standards of Uzbekistan.

$$C = \frac{Q_p}{2\pi\ \sigma_y \sigma_z u} \cdot \exp(-2\frac{y_2}{2\sigma_{y^2}}) \exp\left\{-\frac{(z-He)^2}{2\sigma_z{}^2}\right\} + \exp\left\{-\frac{(z+He)^2}{2\sigma_z{}^2}\right\}$$

[Symbol]

C: Above-ground concentration at a leeward distance R (m)

Q_p: Emission volume

σ_y: Parameter in the horizontal direction (m)

σ_z: Parameter in the vertical direction (m)

Converting 3-min value to 30-min value using the formula below

$\sigma_y = \sigma_{y1} \times (30/3)^{0.2}$ (σ_{y1} ;Pasquill-Gifford)

σ_z: Parameter in the vertical direction (m) (Pasquill-Gifford)

u: Wind speed (m/s)

Calculating the wind speed at the stack outlet level, using the measurement ground-level wind speed (10m) and the elements described below.

$U2 = U1\ (Z2/Z1)^P$

U1: wind speed at measurement height level (m/s), Z1: measurement height level (10m)

U2: wind speed at the stack outlet level (m/s), Z2: Stack height (m)

P: Coefficient of stability

R: Horizontal distance between smoke source and calculated point (m)

z: Above-ground height

He: Effective stack height (m)

$He = H + \Delta H$

H: Actual stack height (m)

ΔH: Elevation height (m)

【Meteorological conditions】

The concentration of NO_2 discharged from the stack having reached the ground by dispersion heavily depends on the diffusion parameter for each of the wind speed and atmospheric stability, as shown in the aforementioned calculation formula.

Calculation is simulated under the conditions shown below, based on the stability and wind speed indicated in the atmospheric stability classification of Pasquill.

Outlet of the stack is located at high elevation, so that atmospheric stability at the stack outlet becomes "Neutral" compared to the instability of atmosphere at ground level. For instance, stability B at ground level is set to be stability C at stack outlet level, and wind speed condition at outlet level is set to be between 1.0m/s and 4.0m/s, accounting for wind speed condition of Stability B with conservative point of view.

Setting conditions for stability and wind speed

Stability		Wind speed conditions at ground level (m/s)
Unstable	B	1.0, 2.0, 3.0, 4.0
Neutral	C	1.0, 2.0, 3.0, 4.0
	D	1.0, 2.0, 3.0, 4.0, 6.0, 8.0,10.0,15.0

(Reference) Pasquill stability categories

Wind speed at ground level U (m/s)	Daytime				Nighttime (rate of solar radiation = 0)
	Rate of solar radiation Q (unit 0.01 kWm^{-2})				
	60 < Q	30 – 59	15 – 29	1 - 14	
U < 2.0	A	A-B	B	D	F
2.0 - 2.9	A-B	B	C	D	E
3.0 - 3.9	B	B-C	C	D	D
4.0 - 5.9	C	C-D	D	D	D
6.0 < U	C	D	D	D	D

Note: This category shows the stability of the atmosphere proposed by Pasquill, English. Category A means the most unstable atmospheric condition; category B being the most stable atmospheric condition; and category D being the intermediate condition.

【Consideration of stack height and Compliance to the standard】

The stack height is set to 60m in the EIA, but actually no specific discussion has been had in setting the stack height.

Emission amount of NO_2 from CCCGP No.2 increases about 1.7 times, from 18.3g/s to 32.5g/s; therefore, the maximum ground concentration of NO_2 will also be expected to become higher than the value specified in EIA report.

As cited above, exhaust gas temperature, which had been set to 126 ºC in the EIA, was set to 100 ºC in the latest consideration, resulting in lower temperature rise caused by calorific value of exhaust gas.
In this regard, the stack height shall be set to achieve the maximum ground concentration lower than that of the EIA conditions (NO_2 emission, stack height of 60m, exhaust gas temperature 126 ºC).

Here, the maximum ground concentration under the condition that exhaust gas temperature of 100 ºC, stack height of every 20m between 80m and180m is predicted and compared with the maximum ground concentration of the initial plan, in order to determine the favorable stack height.

The prediction was conducted for all the cases of stability and wind speed described above.
The prediction result is shown in Table 8.4.1-2. The maximum ground concentration becomes similar to the one of the initial plan, if stack height is set to 160m; thus complying with the regulatory standard of Uzbekistan.

As a result of the consideration by Uzbekenergo through a method used in Uzbekistan, the stack height was set to 90m, on the ground that the maximum ground concentration standard from CCCGP No.2 in Uzbekistan is satisfied by the stack height of 90m.

Table 8.4.1-2 Maximum ground concentration of NO_2 (μg/m^3) for different stack height in CCCGP No.2

Items		Stack height 60m, exhaust gas temperature:126ºC NO_2 emission 18.3 g/s: (EIA)	Exhaust gas temperature: 100 ºC, NO_2 emission 32.5 g/s					
			Stack height 80m	Stack height 100m	Stack height 120m	Stack height 140m	Stack height 160m	Stack height 180m
Maximum ground concentration (μg/m^3)	Stability B	4.6－5.6	8.7 － 9.6	8.2 － 8.7	7.4 － 7.9	6.5 － 7.4	5.8 － 6.9	5.2 － 6.6
	Stability C	3.1－4.3	5.9 － 7.3	5.5 － 6.3	5.3 － 5.6	4.7 － 5.1	4.1 － 4.6	3.6 － 4.3
	Stability D	0.7－2.1	1.4 － 3.1	1.3 － 2.4	1.2 － 1.9	1.1 － 1.6	0.9 － 1.3	0.7 － 1.1

It should be noted that NO_2 contained in the emission gas during plant operation needs to be continuously monitored and confirmed if it meets the regulatory standard of Russia (GOST 29328-92) and Environmental, Health and Safety Guideline for Thermal Power Plant of IFC/WB.

The maximum ground concentration of NO_2 in all the cases with stack height of 90m is shown in Table 8.4.1-3.

The maximum ground concentration (30 min value) with CCCGP No.2 is 9.1μg/m^3 and occurs under the condition that air stability is B, wind speed is 3.0 m/s. This is about 10 % of Uzbekistan environmental standard, and about 5 % of IFC/WB guideline 1hour value.

NO_2 concentration value in residential area of Navoi City is 90μg/m^3 at the maximum, which exceeds environmental standard of Uzbekistan (85μg/m^3), but it is below 1-hour value of IFC/WB EHS General guideline (200μg/m^3).

In consequence, it satisfies the guideline value, even source contribution of CCCGP No.2 is taken into account.

Table 8.4.1-3 Prediction of the maximum ground concentration of NO_2 by CCCGP No.2 (30 min value)

Items	Atmospheric conditions (stability)	Wind speed	Maximum ground-level concentration a (μg/m^3)	Maximum ground-level concentration distance (km)	Current ※ concentration b(μg/m^3)	Environmental standard (MPC) of Uzbekistan (μg/m^3)	IFC/WB EHS General Guidelines (2007)
NO_2	B	1.0 m/s	8.4	3.7	15～90 (average 40)	85	200 (1-hour value)
		2.0 m/s	9.0	2.5			
		3.0 m/s	9.1	2.1			
		4.0 m/s	8.9	1.8			
	C	1.0 m/s	5.7	8.1			
		2.0 m/s	6.5	6.5			
		3.0 m/s	6.8	6.7			
		4.0 m/s	6.8	6.8			
	D	1.0 m/s	1.3	52.1			
		2.0 m/s	2.0	24.6			
		3.0 m/s	2.3	16.6			
		4.0 m/s	2.5	12.8			
		6.0 m/s	2.7	9.9			
		8.0 m/s	2.7	8.3			

		10.0 m/s	2.6	7.2			
		15.0 m/s	2.4	5.8			

※The value, b refers to the measurement result in residential area of Navoi City.

【Prediction result of the total cumulative impact of the power plant】

Assessing impact of the pollutants at the whole power plant, it is necessary to consider the operation condition and gas emission amount of the existing power plant along with the operation of CCCGP No.2.

With CCCGP No.2 in operation, decommission of Unit 3 and 8 has already been determined. Shutdown of Unit 6 and 10 will not cause insufficient heat supply; however, Unit 6 and 10 will start their operation in case that heat supply increases by any chance.

Table 8.4.1-4 describes emissions of pollutants generated from Navoi power plant in case of the shutting-down of Unit 3 and 8 as well as shutting-down of Unit 3, 6, 8 and 10.

In case of shutting-down of Unit 3 and 8, NO_2 emission is increased to 4,687ton/year compared to 4,636 ton/year before CCCGP No.2 in operation. SO_2 is, on the other hand, reduced after CCCGP No.2 in operation.

However in case of shutting-down of Unit 3,6,8 and 10, NO_2 emission is decreased to 4,146 ton/ year compared to 4,636 ton/year before CCCGPNo.2 in operation.

Table 8.4.1-4 Emissions of pollutants Generated from Navoi power plan

Pollutant	Before the project (t/y)		After the project (t/y)		
	EIA	Result of Review	EIA	Result of Review	
Nitrogen dioxide (NO_2)	3,543	4,636	3,454	4,687	4,146
Nitrogen oxide (NO)	575	753	561	729	693
Sulfur dioxide (SO_2)	510	1,132	911	1,118	1,109
Suspended particles (Dust)	＜1	＜1	＜1	＜1	＜1
others	＜1	＜1	＜1	＜1	＜1
notes	Unit 1and 2 stopped; CCCGP No.1 in operation.		Unit 3and 8 stopped; CCCGP No.2 in operation.		Unit 3,6, 8and 10 stopped; CCCGP No.2 in operation.

There is a possibility that NO_2 concentration around the project site slightly exceeds Uzbekistan environmental standard, taking into account the concentration value of residential area in Navoi city. And, it is significant that the environmental impact of the NO_2 generated from the total power plant can be diminished after CCCGP No.2 in operation.

In this regard, NO_2 diffusion prediction before and after operation of CCCGP No.2 was predicted under the meteorological condition of atmosphere stability B when the impact of CCCGP No.2 is the maximum. Of the major winds in the area East wind was selected.
The diffusion after CCCGP No.2 started operation was estimated assuming 2 different cases: the normal operation case that Unit 3, 6, 8, 10 are shut down, and the case Unit 3 and 8 are shut down.

The result of the diffusion estimation of NO_2 before and after operation is described in Table 8.4.1-5 and Figure 8.4.1-1~4.
The maximum ground concentration of NO_2 generated by the operation of the power plant before CCCGP No.2 starts operation is 56.4~62.0μg/m^3, whereas the maximum ground concentration after CCCGP starts operation and Unit3, 6, 8, 10 are shut down is 52.6~56.0μg/m^3.
Regarding the maximum ground concentration of NO_2, 2~9μg/m^3 will be decreased after CCCGP No.2 starts operation compared to before CCCGP No.2 operation in all wind speed.
In this case, assuming that the current concentration value around the power plant is the same level as the one in residential area of Navoi city and that the maximum concentration is 90μg/m^3, the concentration value will become about the same as the standard of Uzbekistan, 85μg/m^3, or even lower, considering this project makes it possible to decrease the concentration by 2 to 9μg/m^3.

In the case of shutting down of Unit 3 and 8, the maximum ground concentration of NO_2 will be 58.4~62.0μg/m^3 .
These concentration values are the same level after operation of CCCGP No.2 compared to the case before operation except at the wind speed of 1.0m/s.

The west side of the power plant is a mixture of residential area and farmland with no source of air pollution. It is expected that the current NO2 concentration value is lower than 90μg/m^3, the value in residential area in Navoi City, and it is also expected that the value will become below the Uzbekistan standard of 85μg/m^3, as the result of the operation of CCCGP No.2.

Table 8.4.1-5 Prediction of the maximum ground concentration of NO_2 by Navoi Power plant

Items	Atmospheric conditions (stability)	Wind speed	Before Operation of CCCGP No.2 (μg/m^3)	After Operation of CCCGP No.2 (μg/m^3)		Environmental reference value of Uzbekistan (μg/m^3)	IFC/WB EHS General Guidelines (2007)
				Stoppage of unit 3,6, 8,10	Stoppage of unit 3, 8		
NO_2	B	1.0 m/s	56.4 (3.9km)	54.2 (3.6km)	58.4 (3.6km)	85	200
		2.0 m/s	61.2 (2.4km)	56.0 (2.4km)	61.9 (2.4km)		
		3.0 m/s	62.0 (1.6km)	54.8 (1.9km)	62.0 (1.9km)		
		4.0 m/s	61.4 (1.4km)	52.6 (1.7km)	60.1 (1.4km)		

Note: the value specified in ( ) is distance from stack of CCCGPNo.2:

Accordingly, it may be concluded that the implementation of the project will contribute to the mitigation of air pollution.
However, in the west side of the power plant, exhaust gas diffuses with the frequent eastern wind, so that the monitoring shall be conducted in the residential area and other areas to check the environmental impact.

(Before operation of CCCGP No.2.: Maximum ground concentration : 56.4 μ g/m^3.distance: 3.9km)

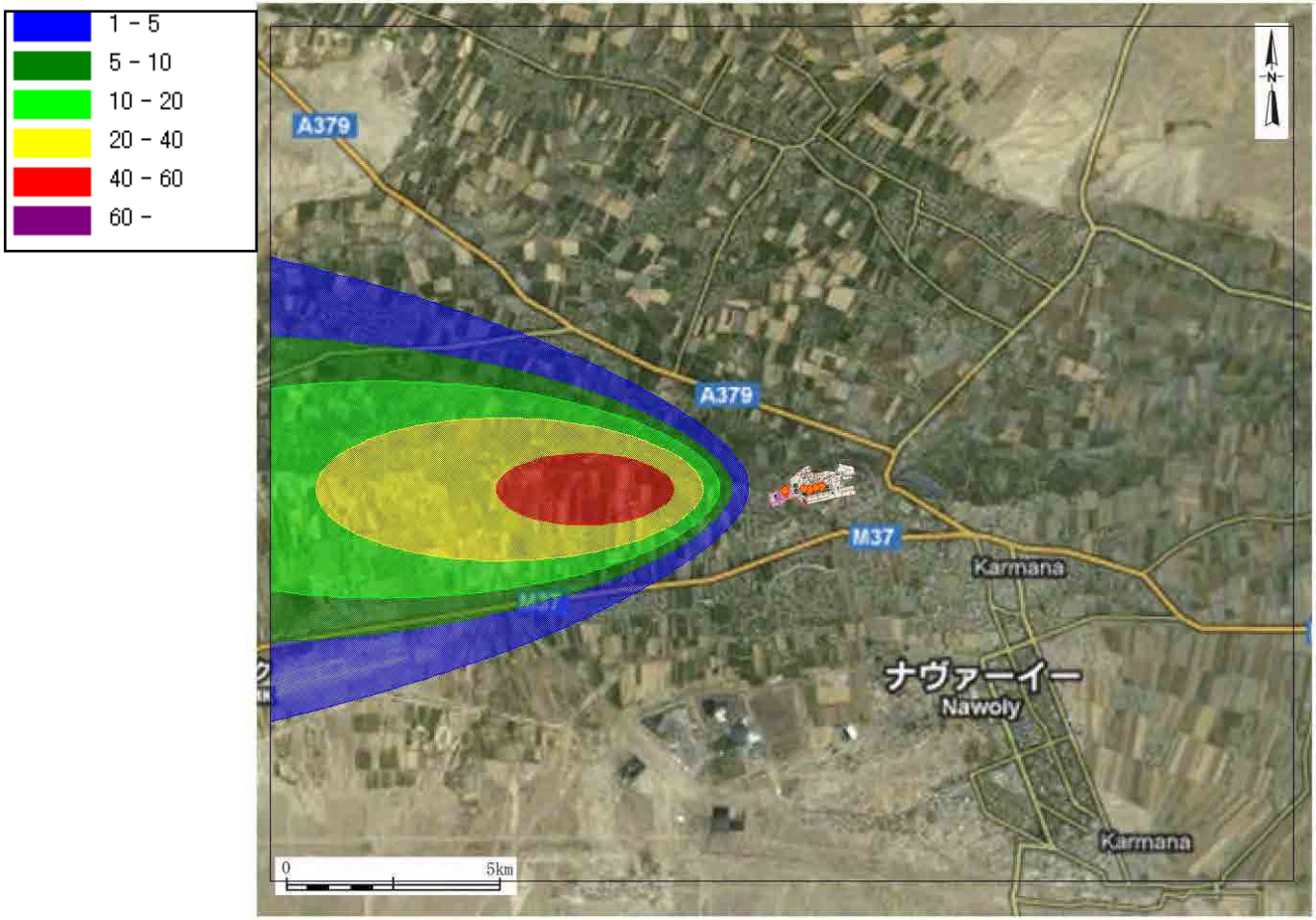


Figure 8.4.1-1(1) Ground level concentration of NO_2., Stability: B, Wind; E, 1m/s

(After operation of CCCGP No.2.- stop of unit 3,6, 8,10:Maximum ground concentration 54.2 μ g/m^3, distance: 3.6km)

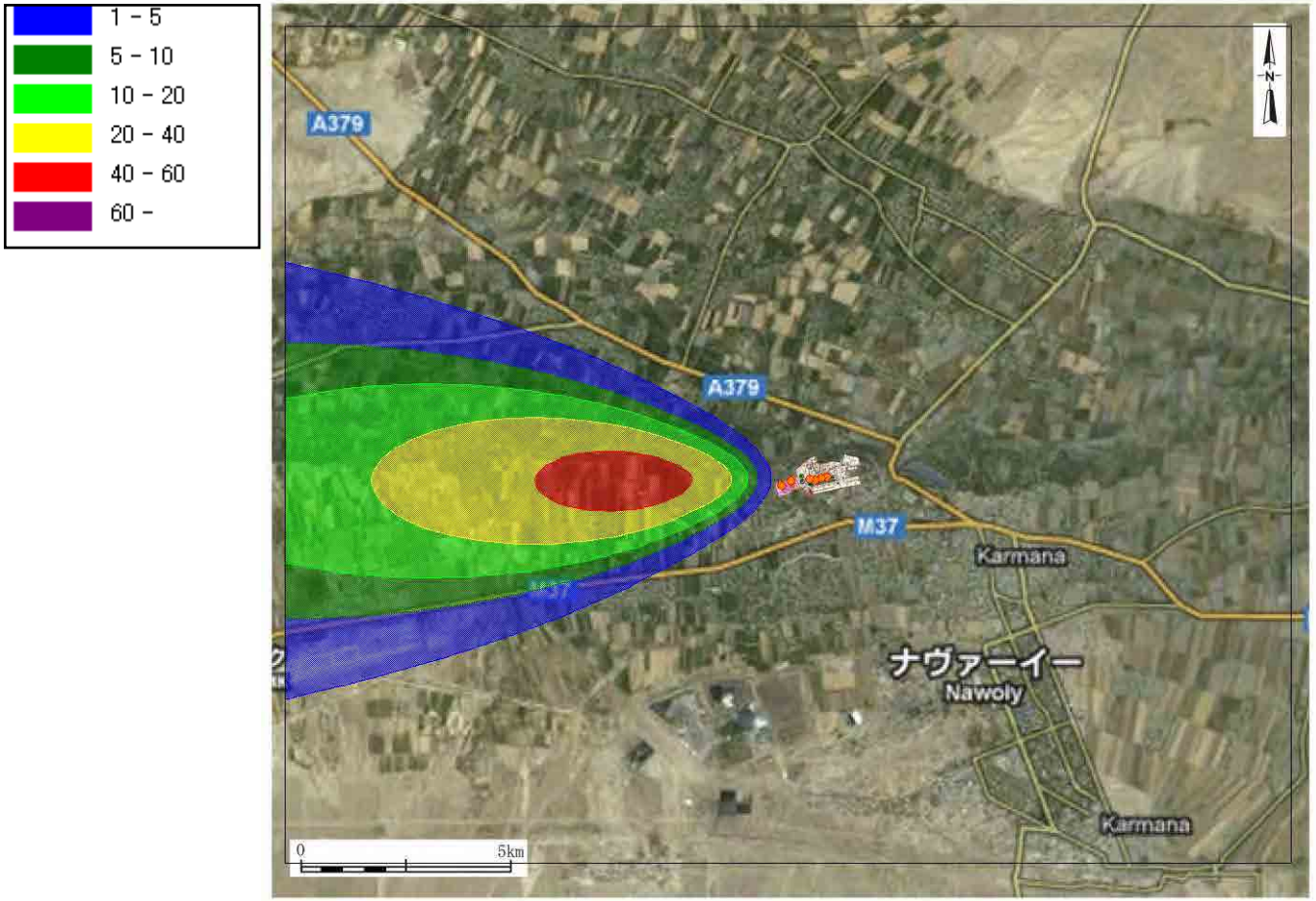


Figure 8.4.1-1(2) Ground level concentration of NO_2, Stability: B, Wind; E, 1m/s

(After operation of CCCGP No.2- stop of unit 3, 8:Maximum ground concentration 58.4 μ g/m^3,distance: 3.6km)

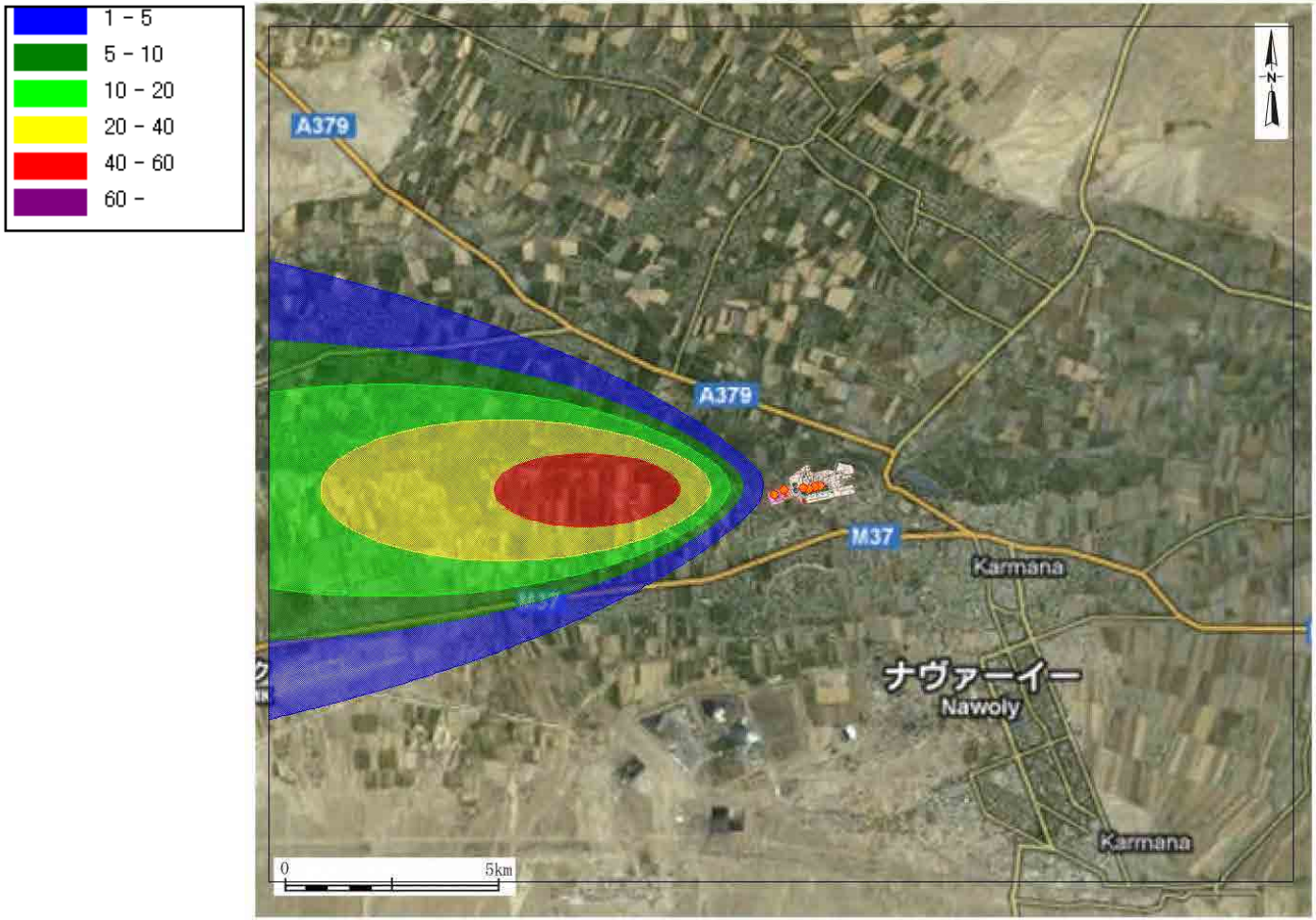


Figure 8.4.1-1(3) Ground level concentration of NO_2, Stability: B, Wind; E, 1m/s

(Before operation of CCCGP No.2:Maximum ground concentration 61.2 μ g/m^3 ,distance : 2.4km)

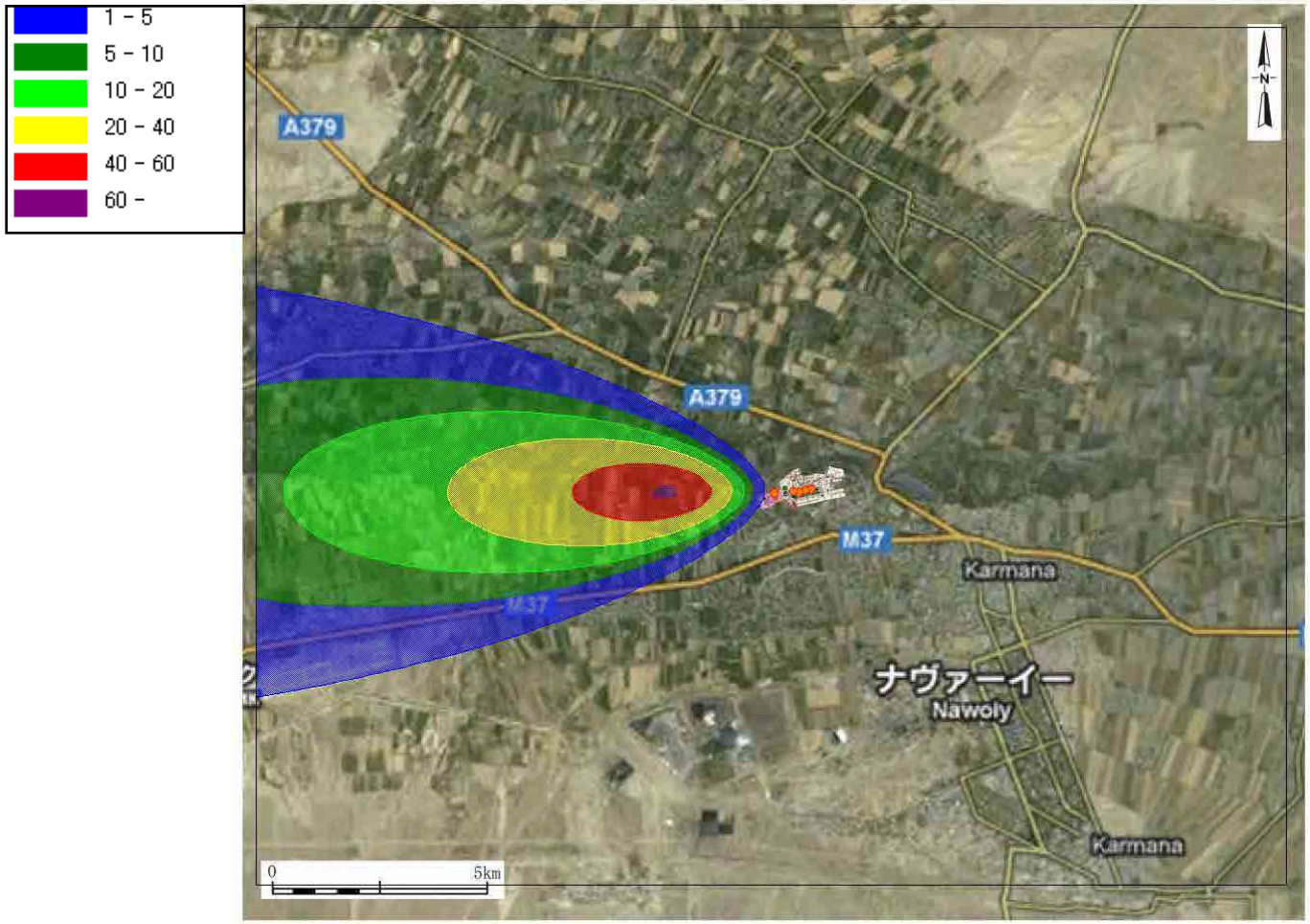


Figure 8.4.1-2(1) Ground level concentration of NO_2, Stability: B, Wind; E, 2m/s

(After operation of CCCGP No.2- stop of unit 3,6, 8,10:Maximum ground concentration 56.0 μ g/m^3 ,distance : 2.4km)

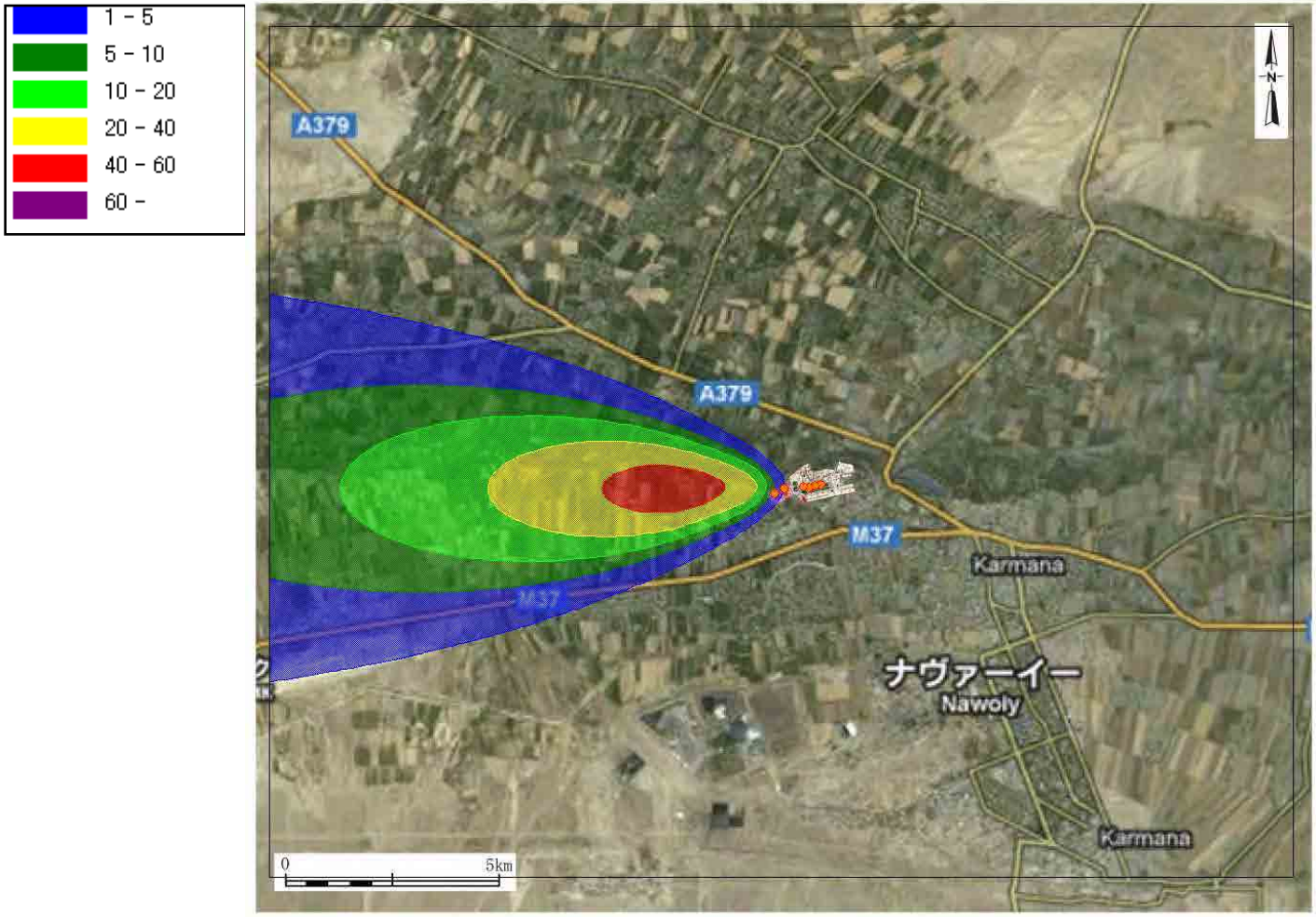


Figure 8.4.1-2 (2) Ground level concentration of NO_2, Stability: B, Wind; E, 2m/s

(After operation of CCCGP No.2- stop of unit 3, 8:Maximum ground concentration 61.9 μ g/m^3 ,distance: 2.4km)

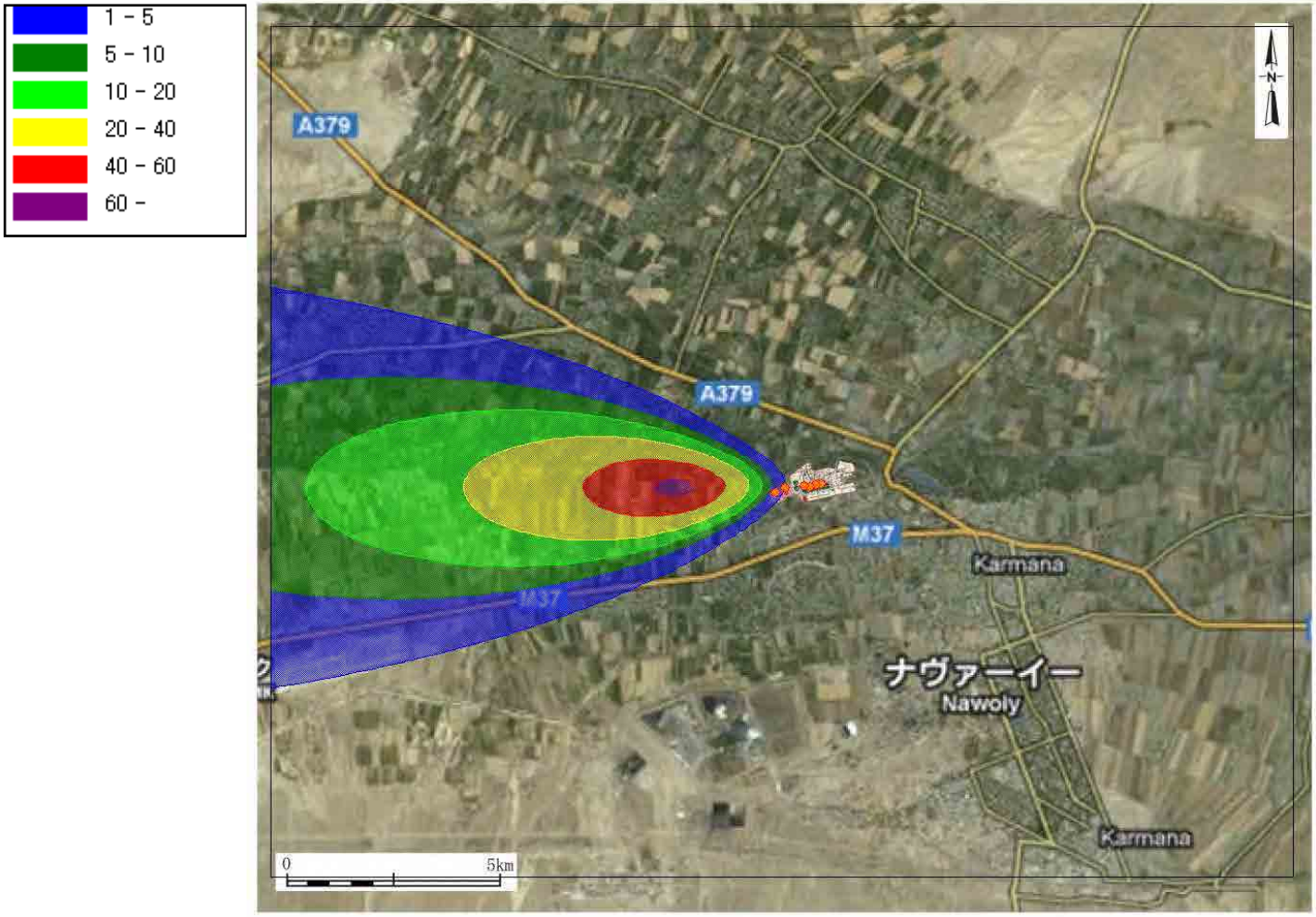


Figure 8.4.1-2 (3) Ground level concentration of NO_2, Stability: B, Wind; E, 2m/s

(Before operation of CCCGP No.2:Maximum ground concentration 62.0 μ g/m^3 ,distance: 1.6km)

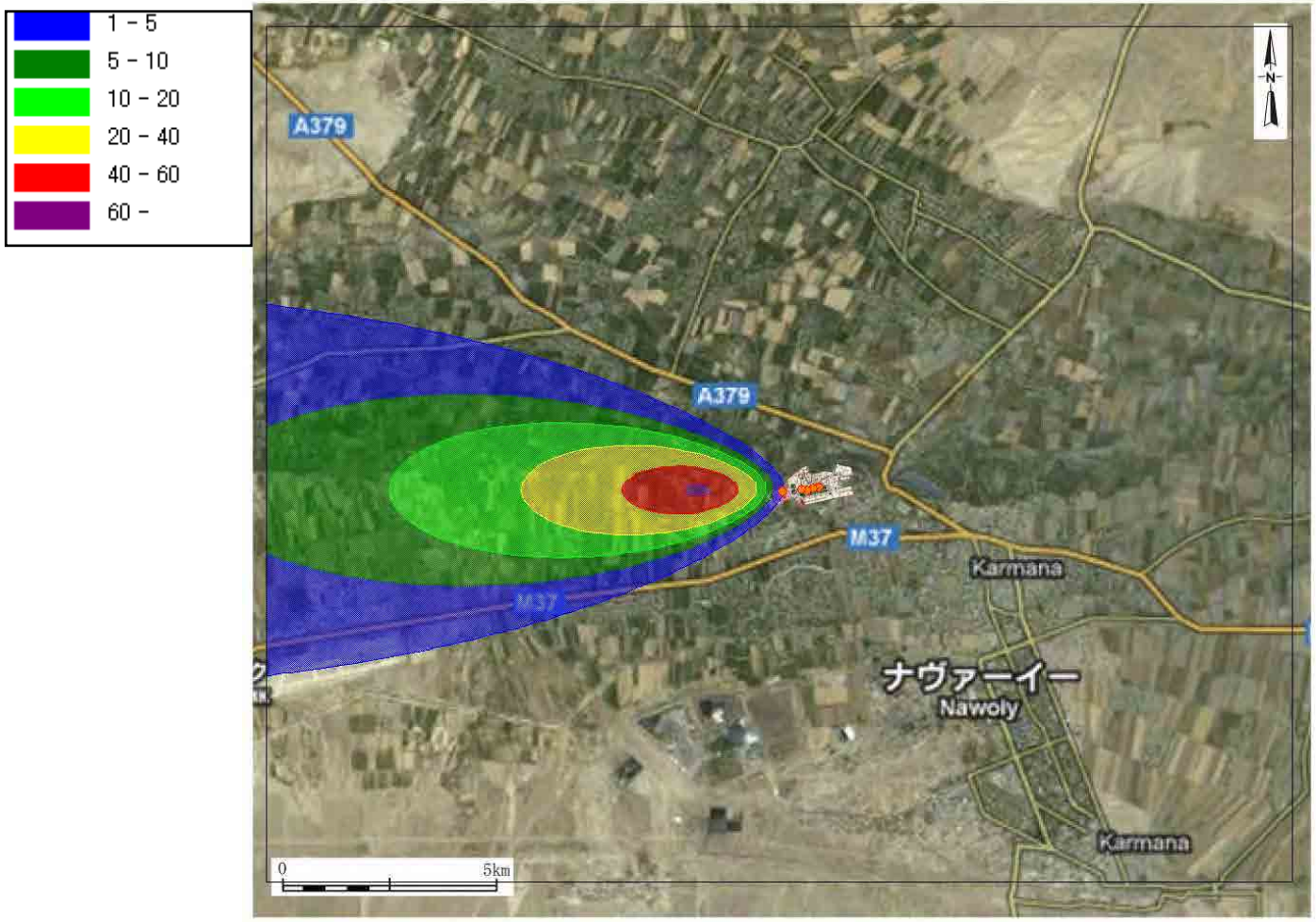


Figure 8.4.1-3(1) Ground level concentration of NO_2, Stability: B, Wind; E, 3m/s

(After operation of CCCGP No.2- stop of unit 3,6, 8,10:Maximum ground concentration 54.8 μ g/m^3 ,distance: 1.9km)

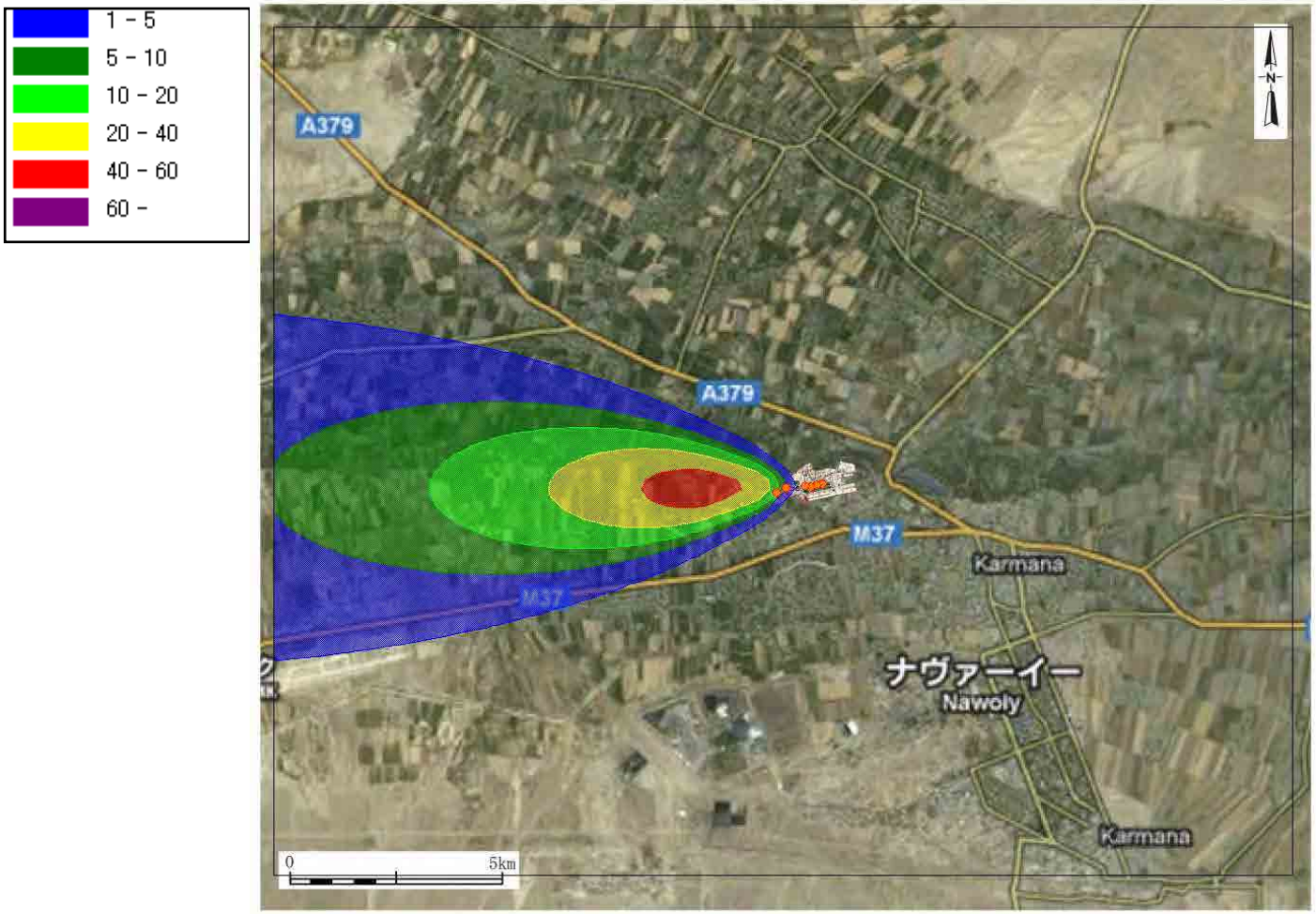


Figure 8.4.1-3 (2) Ground level concentration of NO_2, Stability: B, Wind; E, 3m/s

(After operation of CCCGP No.2- stop of unit 3, 8:Maximum ground concentration 62.0 μ g/m^3 ,distance: 1.9km)

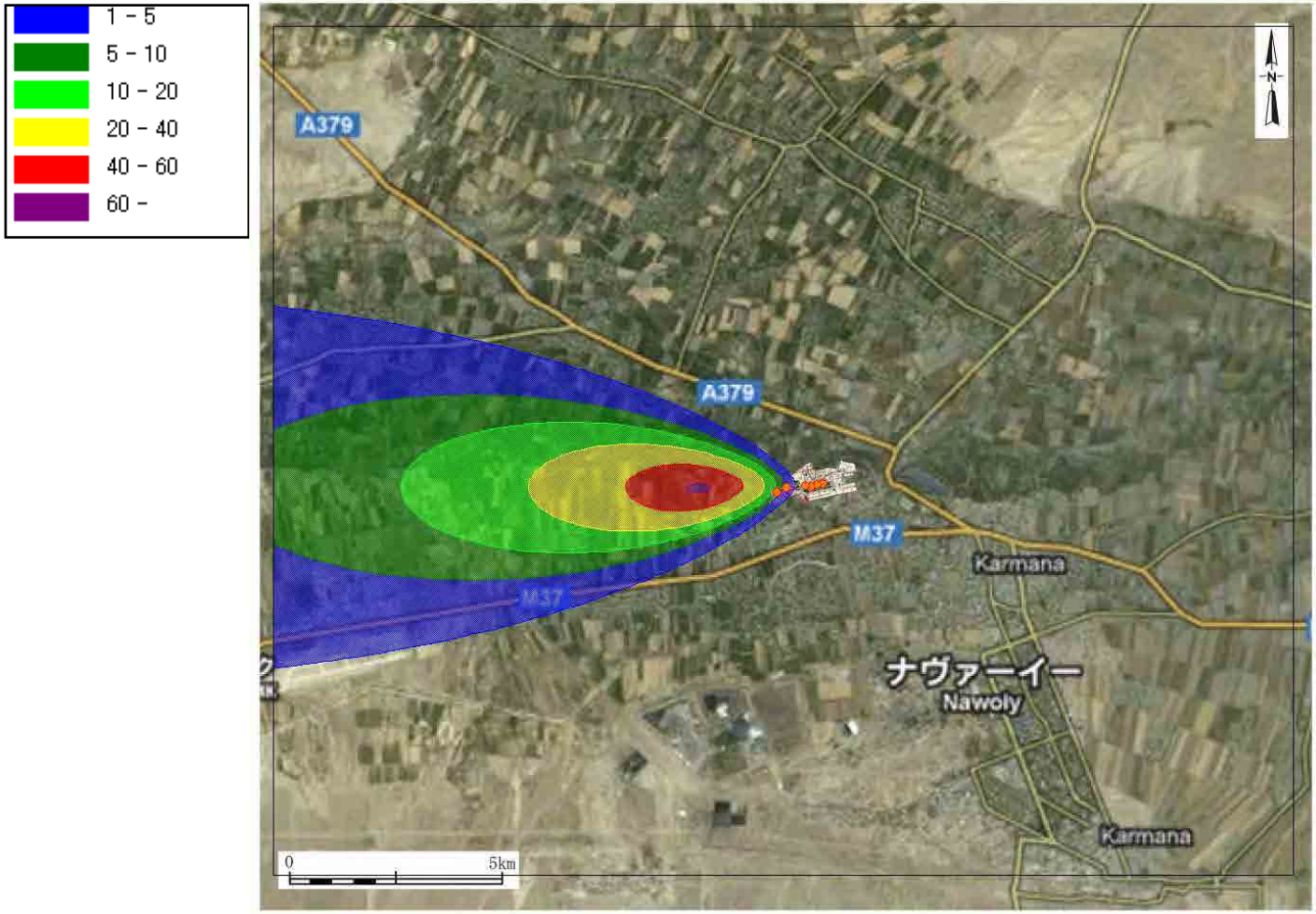


Figure 8.4.1-3 (3) Ground level concentration of NO_2, Stability: B, Wind; E, 3m/s

(Before operation of No.2:Maximum ground concentration 61.4 μ g/m^3 ,distance: 1.4km)

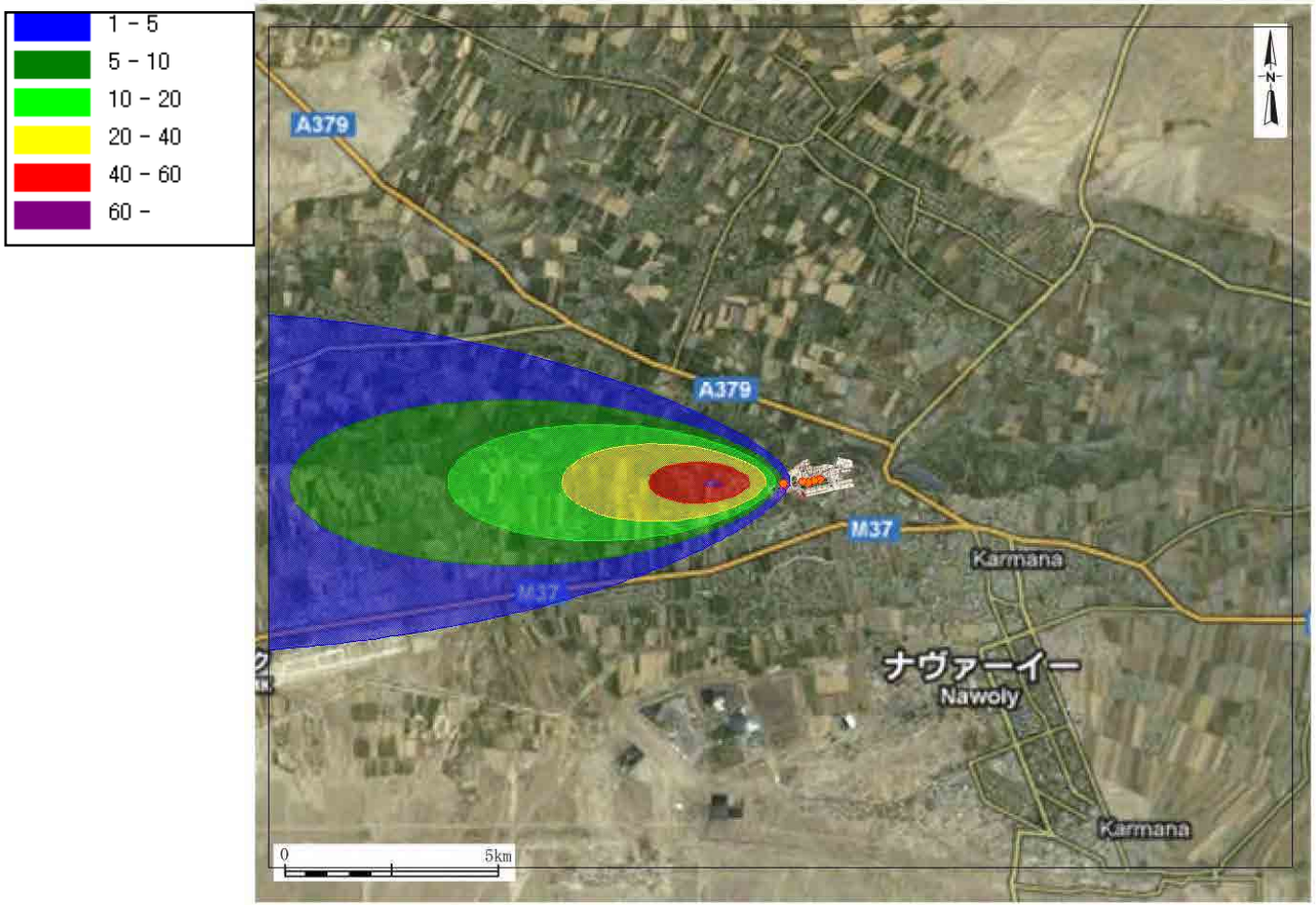


Figure 8.4.1-4(1) Ground level concentration of NO_2, Stability: B, Wind; E, 4m/s

(After operation of CCCGP No.2- stop of unit 3,6, 8,10:Maximum ground concentration 52.6 μ g/m^3, distance:1.7km)

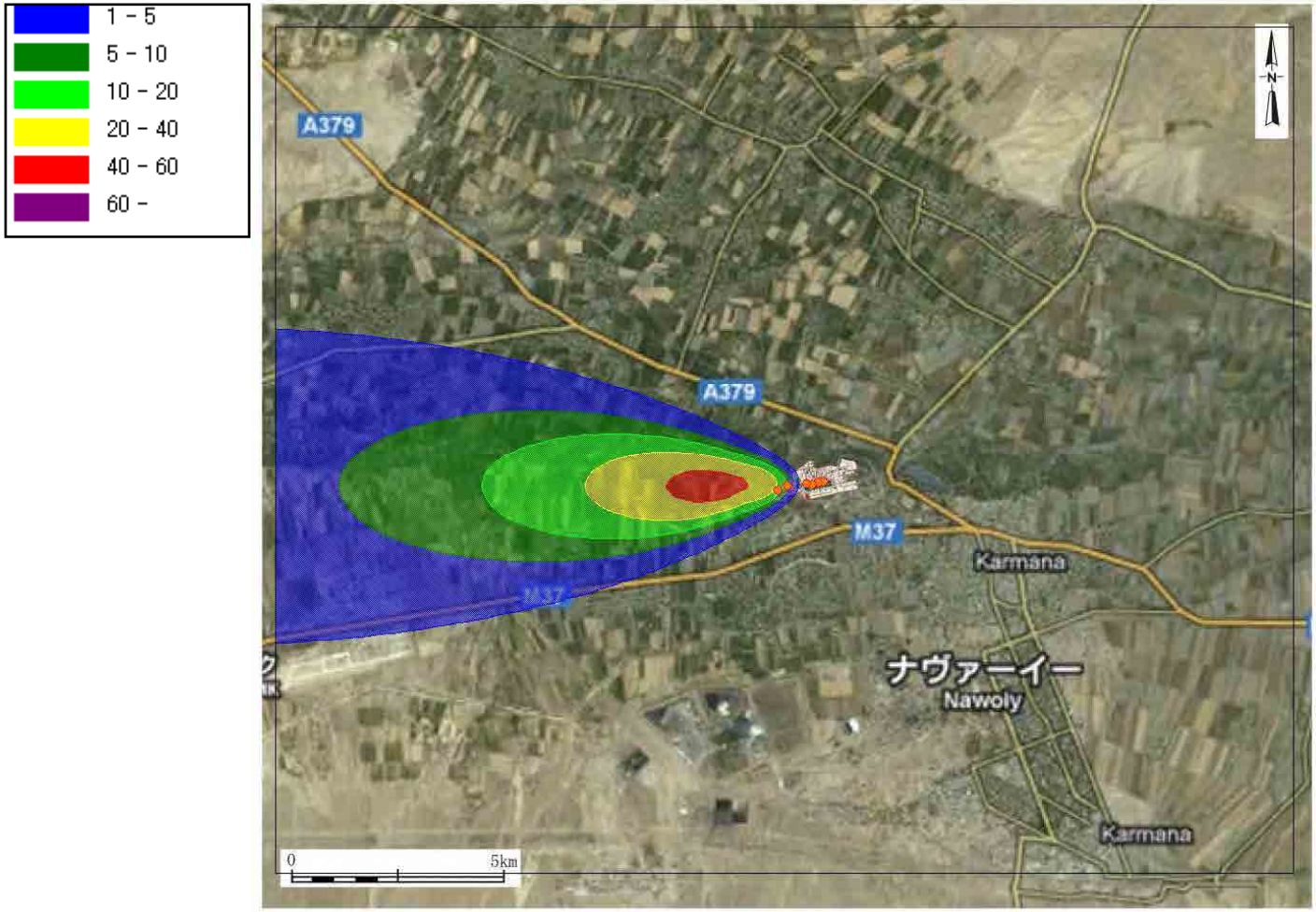


Figure 8.4.1-4 (2) Ground level concentration of NO_2, Stability: B, Wind; E, 4m/s

(After operation of CCCGP No.2- stop of unit 3, 8:Maximum ground concentration 60.1 μ g/m^3 .distance: 1.4km)

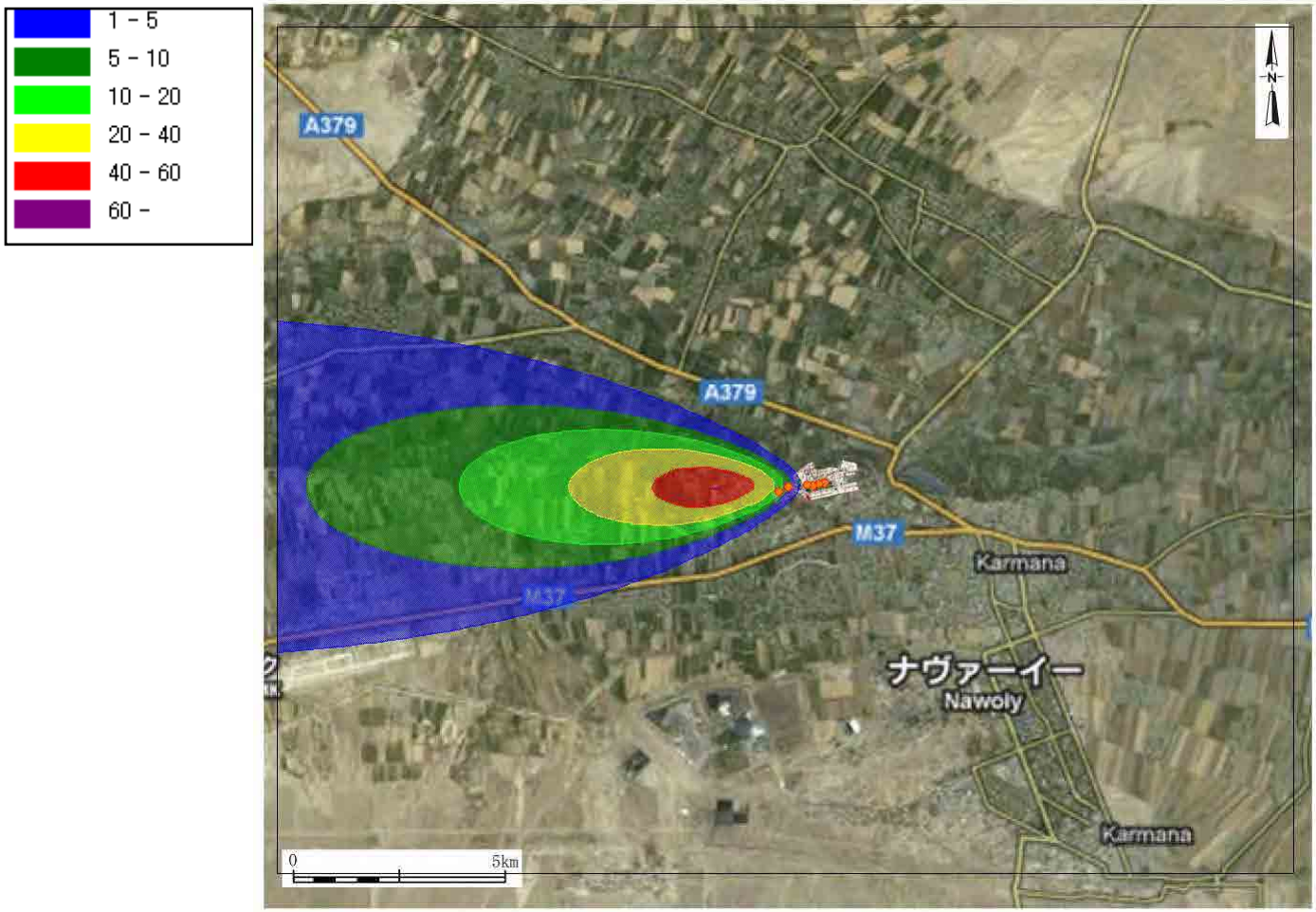


Figure 8.4.1-4 (3) Ground level concentration of NO_2, Stability: B, Wind; E, 4m/s

2) Water pollution and water use

a. Thermal effluent and blow-down from the cooling tower

As for the condenser cooling system in this project, forced-draft cooling tower system and air-cooling system were considered of which forced-draft cooling tower system was finally adopted.

This system does not generate large amount of thermal effluent as is the case of one-through system, and only the 240m^3/h of blow-down from cooling tower will be generated.by use river water.

The reduction of thermal effluent due to the shutdown of Unit 3 and 8 is 28,000m^3/h. The table below shows the amount of thermal effluent and blow-down from cooling tower both before and after this project. The total amount of effluent after this project will be about 65% with the reduction of about 27,760m^3/h.

	Before this project	After this project
The amount of Thermal Effluent (m^3/h)	78,000	50,000
The amount of blow-down from cooling tower (m^3/h)	303	543
Total	78,303	50,543

In the existing Unit 11 and 12, makeup water for cooling tower was supplied from Zerafshan River which is significantly polluted, and was used after only a simplified precipitation treatment. As a result, water quality of blow-down from the cooling tower exceeds the effluent standard in Uzbekistan.

Initially, makeup water of the cooling tower in this project will be supplied from the public water of Navoi whose quality is excellent. However, in response to the requirement of Uzbekenergo to use Zerafshan River water, the means to maintain water quality of blow-down is considered.

The basic policy is to maintain the best water quality from Zerafshan River water to the maximum extent through adequate water treatment such as coagulation-sedimentation method. Sludge generated by water treatment such as sedimentation method is disposed of as waste, and the amount of contaminant contained in intake water is thus reduced at the time of water discharge.

In the initial plan at he cooling tower, component of water quality is concentrated as the cooling water evaporates. In order to keep the concentration of the water quality within 3 times that of the original, supplying make-up water and conducting blowing down will be necessary in order to decrease the corrosion.

On the other hand, in case of using river water, the concentration of water quality will be kept within 2 times that of the original to maintain blow-down water quality, and the change in the amount of make-up water intake from 440m^3/h to 560m^3/h and of blow-down from 120m^3/h to 240m^3/h is considered.

In order to satisfy water quality standard of Uzbekistan as well as EHS Guideline of IFC/WB even when the concentration of waste water quality is kept within 2 times that of

the make-up water, water treatment shall be conducted for intake water and waste water.

b. Washing waste water from water treatment facility

The existing power plant uses intake water from Zerafshan River for the boiler feed water after treatment, and washing wastewater to maintain this treatment facility has exceeded the wastewater standard of Uzbekistan.

Initially, there is requirement for using public water of Navoi City treated with the new water demineralizer for the boiler feed water. However, Uzbekenergo require use Zerafshan River water.
So, a water treatment system with higher performance than the existing one will be introduced to achieve reduction of contaminant.

72.5m^3/h of washing waste water is regularly generated for the maintenance of the water treatment system, whereas the washing waste water used for Unit 3 and 8 is 85m^3/h, considering the power output of Unit 3 and 8 being 310MW, the total power output of the existing power plant being 1,250MW and washing wastewater for the whole power plant being 344m^3/h. Therefore, discharging amount of the washing waste water will be reduced by 10m^3/h.

In this project, thermal water used for heating of the local area and steam for local factories will be needed, and the same water treatment facility will be used; however, the amount of heat supply will not change as a whole before and after this project, washing wastewater will also not increase.

c. Domestic waste water

Domestic wastewater generated by the project will be discharged into the public sewage line and not into Zerafshan River.

d. Oily waste water

Storm water containing oil will be generated 19m3/h at the maximum and treated by oil-separating system before being discharged. The total effluent will be reduced due to shutdown of Unit 3 and 8.

As described above, it is not expected that the waste water discharge into Zerafshan River will degraded water quality of Zerafshan River.
Washing wastewater, blow-down from the cooling tower and oily effluent will be appropriately treated by installing a new water treatment system （Treatment Capacity :＞ 340 m^3/h） and discharged through the existing water outlet.

Wastewater is mixed with other effluent at the outlet, and water quality at the outlet of the treatment facility shall be monitored to confirm the compliance to the effluent standard of Uzbekistan and IFC/WB.

e. Water intake from Zerafshan River

560m^3/h of water will be taken as make-up water for cooling tower will be taken. The reduction of intake water due to the shutdown of Unit 3 and 8 is 28,000m^3/h. The table below shows the amount of intake water and make up water for cooling tower both before

and after this project. The total amount of intake water after this project will be about 66% with the reduction of about 27,440m^3/h.

	Before this project	After this project
The amount of Cooling water (m^3/h)	78,000	50,000
The amount of make up water for cooling tower (m^3/h)	1,750	2,310
Total	79,750	52,310

3) Noise

a. Construction phase

Quantitative noise prediction during construction phase is not conducted in EIA for CCCGP No.2. Since the residential area is located close by, prediction was conducted during this survey mission and environmental impact is confirmed.

Noise level caused by operation of construction equipment was estimated.
The nearest residence, excluding houses to be relocated, is located 300m west and south of the project site, and 400m radius including those houses is set as the prediction area.

【Theoretical Formula】

Noise level has been estimated from noise data of respective construction equipment according to the following theoretical formula.

$$L_{PA} = L_{WA} - 20\log_{10} r - 8 - A_{\gamma} - A_{E}$$

[Symbol]

L_{PA}: Noise level at the estimation point (dB)
L_{WA}: A-characteristic correction power level at noise source (dB)
r: Distance from noise source to estimation point
A_{γ}: Amount of attenuation by partition wall (dB)
A_E: Amount of attenuation by air suction (dB)

【Data of noise source】

The major construction machinery used in the construction work includes a dump truck, bulldozer and back hoe for excavation, a hydraulic hammer used for pile driving, a truck crane for transportation of the equipment and material, and a mixer for producing concrete.
Table 8.4.1-6 shows the noise level of the construction machinery and the number of machines.

Table 8.4.1-6 Noise level of major construction machinery

Machine type	Scale	Noise source level (dB)	Number of machines
Truck crane	50t	116	4
Dump truck	11t	113	4
Back hoe	0.6m^3	110	2
Bulldozer	11t	99	1

Machine type	Scale	Noise source level (dB)	Number of machines
Hydraulic hammer	4.5t	95	2
Concrete pumping car	65～85m^3/h	113	2
Concrete mixer	4.5 m^3	105	4
Air compressor	10.5～11.0m^3/min	105	5

【Calculation conditions】

All the aforementioned machines are assumed to be operating simultaneously.

In actual practice, excavation and pile driving work are performed sequentially according to the work schedule, so simultaneous operation of all the aforementioned machines is not frequent.

【Prediction result】

Figure 8.4.1-5 shows the distribution of noise levels for each estimation point during the operation of the construction machinery.

The noise level resulting from the operation of the construction machinery is slightly over 55dB at 300m from the boundary of the site, and below 55 dB at 400m from the boundary, which meets daytime environmental standard of the Uzbekistan and IFC/WB guidelines, but exceeds the nighttime standard of 45dB.

In the actual construction work, the schedule management will be performed to ensure leveling of the amount of construction work wherever possible, and the state-of-the-art low-noise equipment will be introduced. Thus, efforts will be made to minimize the noise impact.

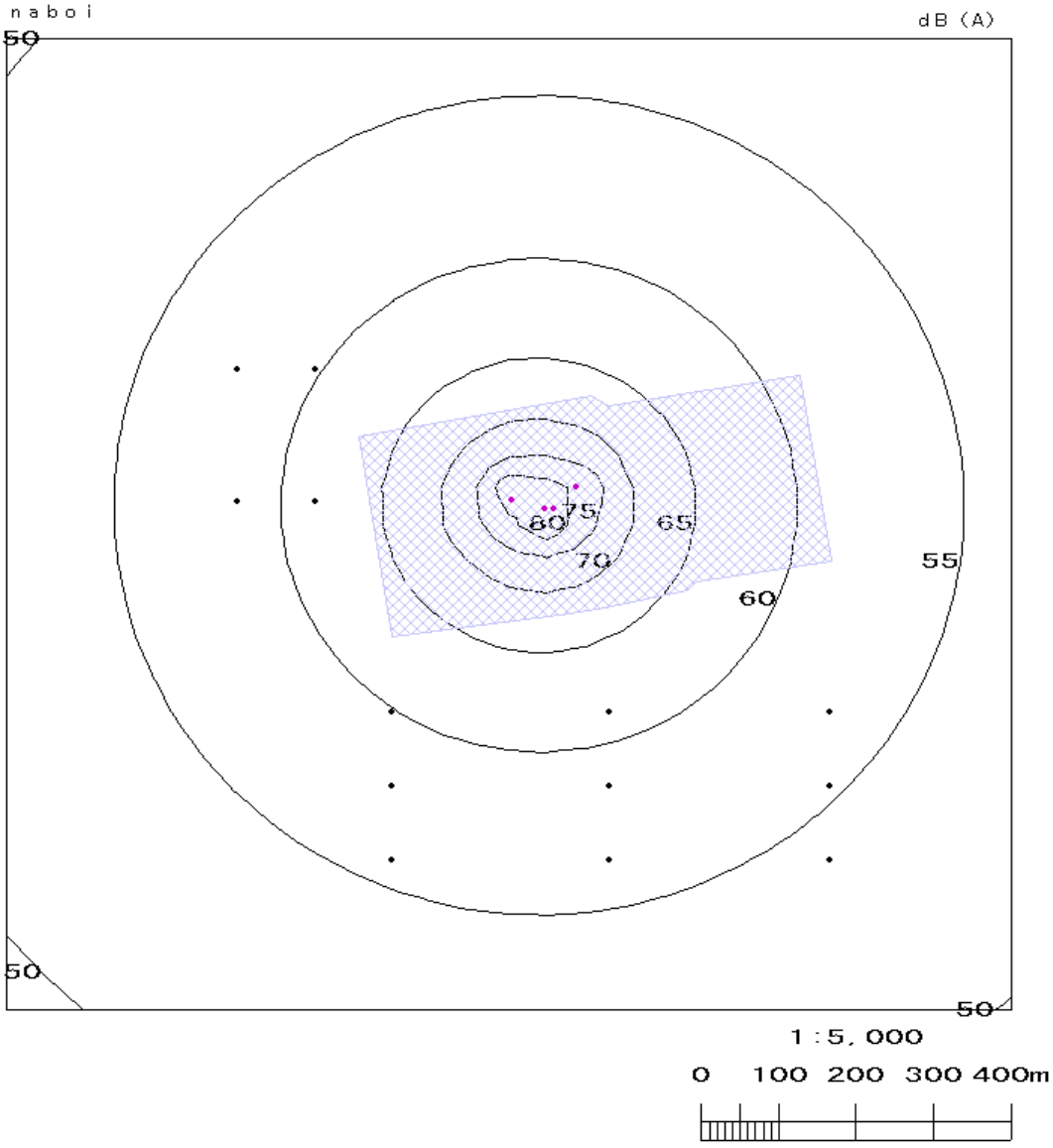


Figure 8.4.1-5 Distribution of noise levels during construction phase

b. Operation phase

Quantitative noise prediction during operation phase is not conducted in EIA for CCCGP No.2. Since the residential area is located close by, prediction was conducted during this survey mission and environmental impact is confirmed.

Noise level was simulated according to the same theoretical formula as in case of construction phase.
Likewise, the extent of prediction area is set to 400m radius from the project site.

【Data of noise source】

The major machinery of noise source in operation phase includes turbine, pumps, air compressors, and cooling towers at CCCGP No1 and CCCGP No.2
The noise level of power generation facility calculated from CCCGP project in Japan is described in Table 8.4.1-7.

Table 8.4.1-7 Noise level of power generation facility (CCCGP No1 and No.2)

Machine type	Noise source level(dB)	Octave band (Hz)							
		63	125	250	500	1000	2000	4000	8000
HRSG	75.0	73.7	51.3	59.3	57.4	59.8	62.5	66.2	47.6
Water supply pump	91.6	71.0	77.0	87.0	88.0	80.0	79.0	78.0	73.0
Cooling tower fan	85.0	68	70	78	78	80	75	75	70.00
Stack	80.4	76.4	76.7	70.5	68.2	60.8	53.5	52.1	55.9
Circulation water pump	98.9	85	85	88	91	94	92	89	86
Gas turbine	80.3	52.2	63.5	69	69.5	74.2	76	73.3	55.3
Steam turbine	80.0	48	52.2	72	73.1	75.1	74.8	62.2	49.5
Gas compressor	99.3	75.5	85.5	91.5	92.5	94.5	92.5	85.5	76.5
Condensate pump	90.4	49.2	63	72.4	80.8	86	85.8	81.7	73.9

Note:
1. Noise source level is calculated from A-characteristic correction power level at 1m from noise source.
2. Calculation under the condition that gas turbine and steam turbine are equipped with a cover.

【Prediction result】

Figure 8.4.1-6 shows the distribution of noise levels from CCCGP No1 and CCCGP No.2 during the operation phase of CCCGP No.2. The noise level is below 55dB at 300m from the boundary of the site, and 50 dB at 400m from the boundary, which meets daytime environmental standard of the Uzbekistan and IFC/WB guidelines. The nighttime noise standard, however, is not satisfied, and introduction of further mitigation measures such as low-noise type equipment, tree-planting on the boundary of the site, installation of soundproof wall, and monitoring will be necessary.

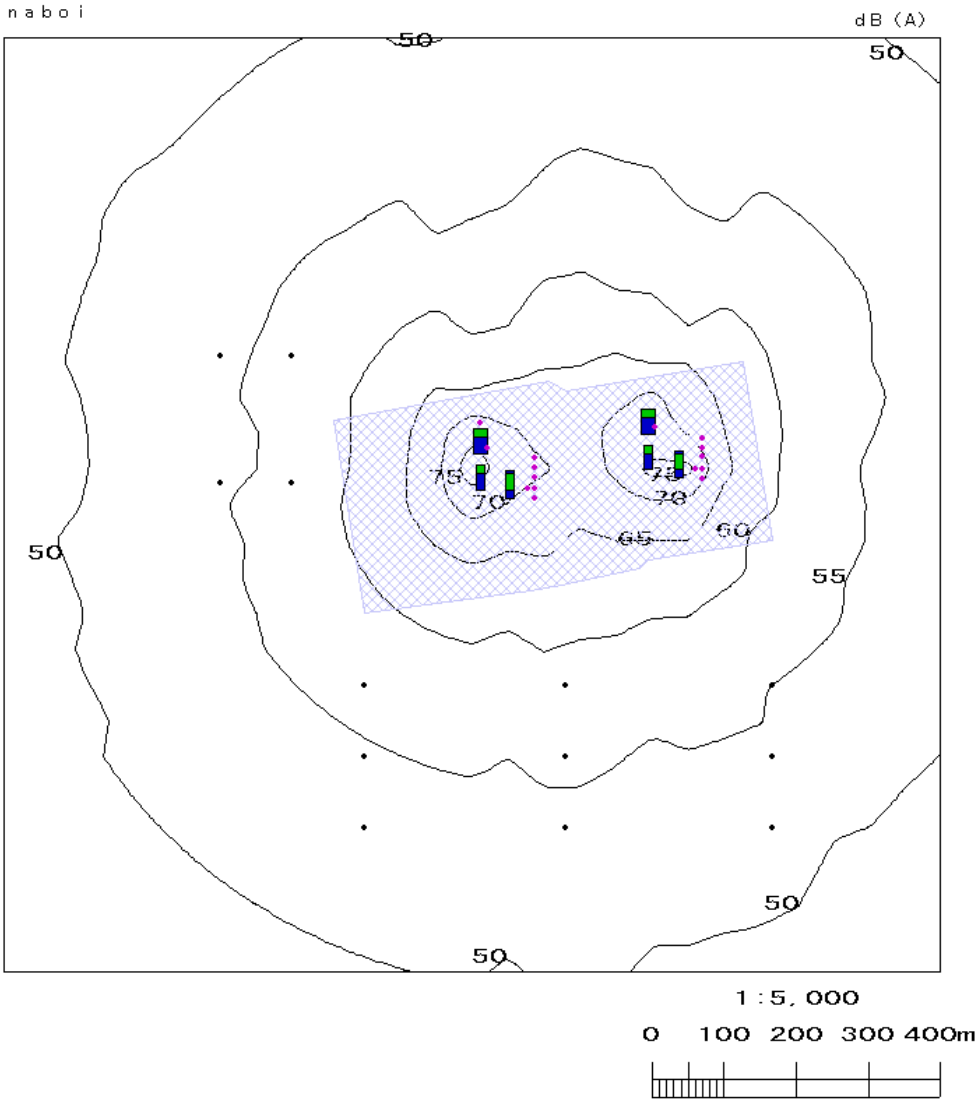


Figure 8.4.1-6 Distribution of noise levels during operation phase

3) Vibration

a. Construction phase

Quantitative vibration prediction during construction phase is not conducted in EIA for CCCGP No.2. Since the residential area is located close by, prediction was conducted during this survey mission and environmental impact is confirmed.

The major construction machinery used in the construction work includes a dump truck, bulldozer and back hoe for excavation, a hydraulic hammer used for pile driving, a truck crane for transportation of the equipment and material, and a mixer for producing concrete. Table 8.4.1-8 shows the vibration level of the construction machinery at different distance in the example of CCCGP project in Japan. Vibration level at the residential area 300m from the plant site is below 40dB which is very low.

Table 8.4.1-8 Vibration level of construction power plant machinery

Machine type	Scale	Vibration level by distance (dB)			
		5m	100m	200m	300m
Truck crane (hydraulic)	50t	69	47	36	25
Dump truck	11t	69	47	36	25
Back hoe	$0.6m^3$	80	59	47	37
Bulldozer	11t	75	64	53	42
Hydraulic hammer	4.5t	80	59	47	37

b. Operation phase

Quantitative vibration prediction during operation phase is not conducted in EIA for CCCGP No.2. Since the residential area is located close by, prediction was conducted during this survey mission and environmental impact is confirmed.

Machinery of vibration sources in the power plant is basically installed on a strong foundation, and therefore vibration level attenuates with distance.
Table 8.4.1-9 describes the vibration level of a circular water pump, a gas turbine, a steam turbine and a gas compressor by distance from the example of CCCGP project in Japan. Vibration level at the residential area 300m from the project site is 30dB, a sufficiently low level.

Table 8.4.1-9 Vibration level of power plant machinery

Machine type	Vibration level by distance (dB)		
	1m	100m	300m
Circulation water pump	67	38	16
Gas turbine	80	51	29
Steam turbine	74	45	23
Gas compressor	58	29	2

8.4.2 Environmental assessment

The environmental impact assessment according to the result of the survey is described in Table 8.4.2-1. Refer to the environmental checklist for more details.

Table 8.4.2-1 Result of the environmental assessment

No.	Items	Assessment at the scoping				Assessment based survey results				Reason for assessment (blue figure: construction period only)
		Construction period		Operation period		Construction period		Operation period		
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	
【Pollution】										
1	Air pollution	N	A	B	A	N	A	B+	B-	- Temporary emission of air pollutants (Sox, NOx, etc) from heavy machines and vehicles and flying dust may occur, and a residential area is nearby. - Fuel low-sulfur gas is used and very little SO_2 and soot is generated from the gas turbine, but NO_2 is emitted. - The old power plants will be shut down and total NO_2 emission of the power plant will be reduced. - Maximum ground concentration of NO_2 will also be improved by the stoppage of the existing facility.
2	Water pollution	N	A	B	A	N	A	B+	B-	- Muddy water after rain, domestic wastewater generated by workers is temporarily generated. - Forced draft cooling tower cooling system will be adopted, and large amount of thermal waste water discharge is not predicted. - Decommission of Unit 3 and 8 will also diminish the thermal waste water. - Cooling tower blow-down and washing wastewater from water demineralizer will be generated. - Washing waste water from the existing water demineralizer will be reduced as a result of stoppage of Unit 3 and 8. - Domestic wastewater generated by the project will be discharged into the public sewage line
3	Waste	N	B	B	B	N	B	B	B	- Domestic waste, waste oil, waste material will be generated. - Waste oil from the equipment and oil-separating system of the waste-water treatment system and sludge from the precipitation system of the waste-water treatment system will be generated, but will be diminished after decommissioning of the existing Unit 3 and 8. - As river water, not public water, will be used for boiler feed water and make-up water for cooling tower, sludge will be generated from the water treatment system.

No.	Items	Assessment at the scoping				Assessment based survey results				Reason for assessment (blue figure: construction period only)
		Construction period		Operation period		Construction period		Operation period		
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	
										- Domestic waste is generated from the project establishment.
4	Noise/vibretion	N	A	N	A	N	A	N	A	- Temporary noise from the construction machines and vehicles will be generated. There is a residential area nearby. Noise standard for daytime will be met, but nighttime will not be met. - Noise from cooling tower fan, turbine, pumps is predicted. Residential area is nearby. Noise standard for daytime will be met, but nighttime will not be met.
5	Subsidence	N	N	N	N	N	N	N	N	- No pumping of ground water.
6	Odor	N	N	N	N	N	N	N	N	- Materials generating bad smell will not be used during construction and operation phase.
【Natural environment】										
1	River water	N	N	B	N	N	N	B+	B-	- No pumping of river water. -- Decommission of Unit 3 and 8 will also diminish the intake of river. - River water, not public water, will be used for boiler feed water and make-up water for cooling tower, but may be diminished after stoppage of the existing facilities. . .
2	ground water	N	N	N	N	N	N	N	N	- No pumping of ground water.
3	Protected area	N	N	N	N	N	N	N	N	- The project site does not include protected area.
4	Terretrial ecosystem	N	B	N	B	N	B	B	B	- Air pollution and noise during construction may have temporary impact on terrestrial organisms. - Air pollution and noise/vibration resulting from power generation will cause negative effect to terrestrial organisms. - Air pollution will be mitigated by shutdown of the existing power plant. - The project site is adjacent to the residential area and the power plant already under influence of human activity.
5	River ecosystem	N	B	B	B	N	B	B+	B-	- Water turbidity caused by construction work may have temporary impact on river organisms. - Forced draft cooling tower cooling system will be adopted, and large amount of thermal waste water discharge is not predicted. - Decommission of Unit 3 and 8 will also diminish the thermal waste water.

No.	Items	Assessment at the scoping				Assessment based survey results				Reason for assessment (blue figure: construction period only)
		Construction period		Operation period		Construction period		Operation period		
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	
										- Cooling tower blow-down and washing wastewater from water demineralizer will be generated. - Washing waste water from the existing water demineralizer will be reduced as a result of stoppage of Unit 3 and 8. - Domestic wastewater generated by the project will be discharged into the public sewage line - Decommission of Unit 3 and 8 will also diminish the intake of river. - River water, not public water, will be used for boiler feed water and make-up water for cooling tower, but may be diminished after stopping of the existing facilities.
6	Precious species	N	B	N	B	N	B	B	B	- The project site is adjacent to the residential area and the power plant already under influence of human activity. - No existence of precious species in the project site and presence of four species in Zerafshan river are reported - Same effect above river Ecosystem.
【Social environment】										
1	resettlement	A	A	A	A	N	A	N	A	Land acquisition of 22ha for construction of transmission line and road will result in resettlement of 33 households.
2	Employment and livelihood	B	B	B	B	B	B	B	B	- The new employment and new business in the local area may increase the income of the local people in the surrounding area. - The number of workers employed from local resident will be about 450 persons in construction and 50 persons in operation - Income gap between the project workers and the local people may occur.
3	Local society	B	B	B	B	B	B	B	B	- Increased employment and new business will enhance the development of the local economy. - Access roads had already been constructed. .-Provide dormitories, recreation room, medical points during construction - In nearby Navoi City, hospitals and other social infrastructure are fully available. - During construction and operation, the workers will have a medical examination ・Nearly national road is wide and traffic volume is not so large

No.	Items	Assessment at the scoping				Assessment based survey results				Reason for assessment (blue figure: construction period only)
		Construction period		Operation period		Construction period		Operation period		
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative	
										- Construction work will cause increased traffic in the road in the surrounding area, which may cause increased risk of traffic accident. - Increased traffic may damage the road in the surrounding area.
4	Cultural heritage	N	N	N	N	N	N	N	N	- No archeological, historical, cultural, and religious heritage site exists within the site.
5	Landscape	N	N	N	N	N	N	N	N	- The project site is adjacent to the residential area and the power plant with much human activity and is not a significant landscape area.
6	Minorities	N	N	N	N	N	N	N	N	- The project site is adjacent to the residential area and the power plant with much human activity and not an area for minorities to live in groups.
7	Labor environment	N	B	N	B	N	B	N	B	- The utility will implement the project in accordance with the labor law of the country and make a Safety Hygiene plan. - The utility will provide protective glasses, mufflers, earplugs, and other protective tools for workers - The utility will subcontract a security firm to deploy security guards.
【Others】										
1	Global warming	N	B	B	N	N	B	B	B	- Temporary emission of co2 from heavy construction equipment and vehicles. - CO_2 will be generated by fuel combustion - The reduction of CO_2 emission concerning this project compared with an average power generation facility in Uzbekistan is more than 684,150 tons per year.

Notes: The categorization criteria is as follows.
A: causes serious impact.
B: causes certain degree of impact.
N: No impact.
This project contains the construction of a newly built power plant as well as shut-down and demolition of the existing power plant. Therefore, in case that the degree of positive and negative impacts are similar to each other, both are to be rated as “B”, and in case that either positive or negative impacts is higher than the other, rating of “B+” is to be given to the higher impact one and “B-” is given to the lower impact one.

8.5 Comparison of alternatives including zero-option

8.5.1 Consideration of the zero option

In the case where CCCGP No.2 is not constructed and the existing old-type power plants (Unit 3 and Unit 8) continue operation, the air quality around the plant area will remain in a bad condition, the reliability of the facility will decrease, and the risk of accident will increase.

8.5.2 Consideration of the alternative project site

In the EIA, the north end of the existing power plant site is considered as an alternative site for constructing CCCGP No.2 (Figure 8.5.2-1).
However, further consideration of this plan was called off for by the reasons described in the table below.
The current proposed site facing the west of CCCGP No.1, even though resettlement of 33 households is predicted, is considered the most favorable alternative.

Table 8.5.2-1 Comparison of the alternative site

Item	The north end of the existing power plant site（Site A）	The site facing west of CCCGP No1 (proposed site) （SiteB）
Technics	-Construction of gas supply facility is necessary within the operating plant site and the construction activity involves high risk.	-New site and low risk for construction of gas supply facility.
Topology	-Not enough space for construction activity. -Not enough space for constructing a storage facility.	-Enough space for construction activity. -Enough space for constructing a storage facility.
Resettlement	-Destruction and resettlement of the existing 200 living houses and 400 summer house within the site is predicted.	-There are no houses within the site and no resettlement is predicted. -There are 23 houses and bases of 10 houses with in Transmission line.

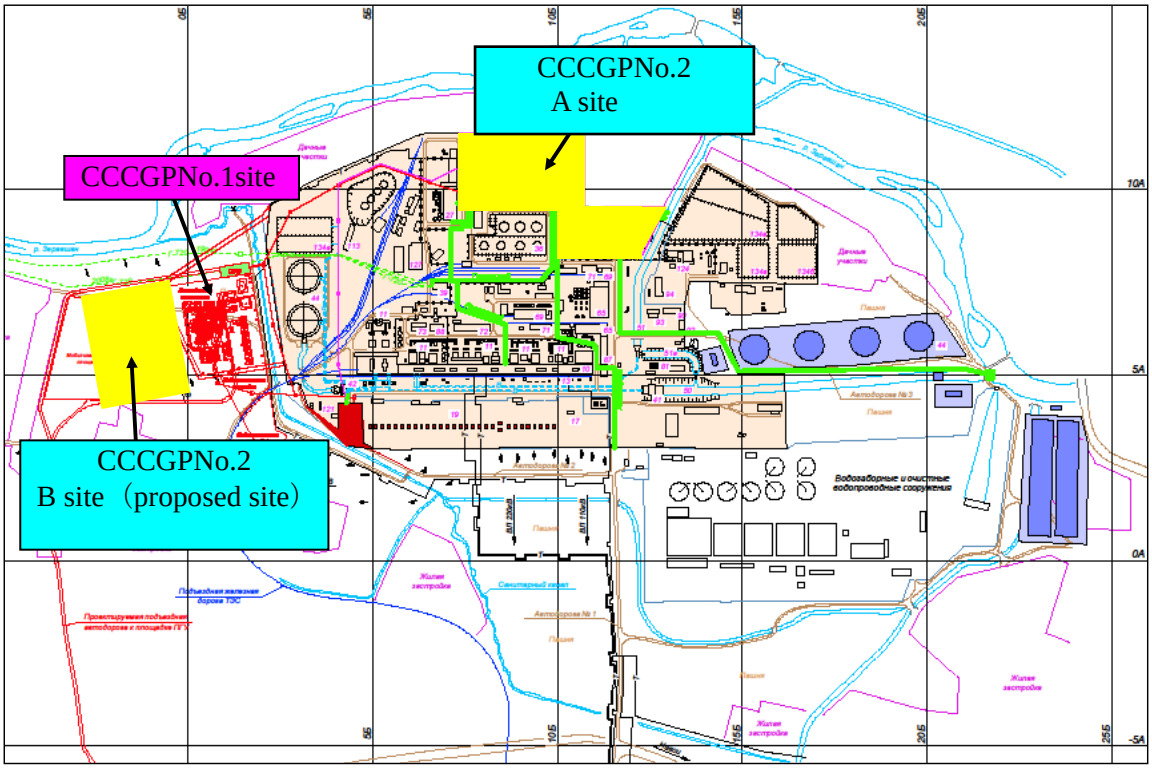


Figure 8.2.5-1 Location of Alternative project site A and B

8.5.3 Consideration of cooling system for the condenser

While the condensers in the existing power plants, except Unit 11 and 12, adopt one-through system, either forced draft cooling tower system or forced draft air cooling system will be adopted in the CCCGPNo.2 power plant.
The comparison of the above cooling systems is described below.

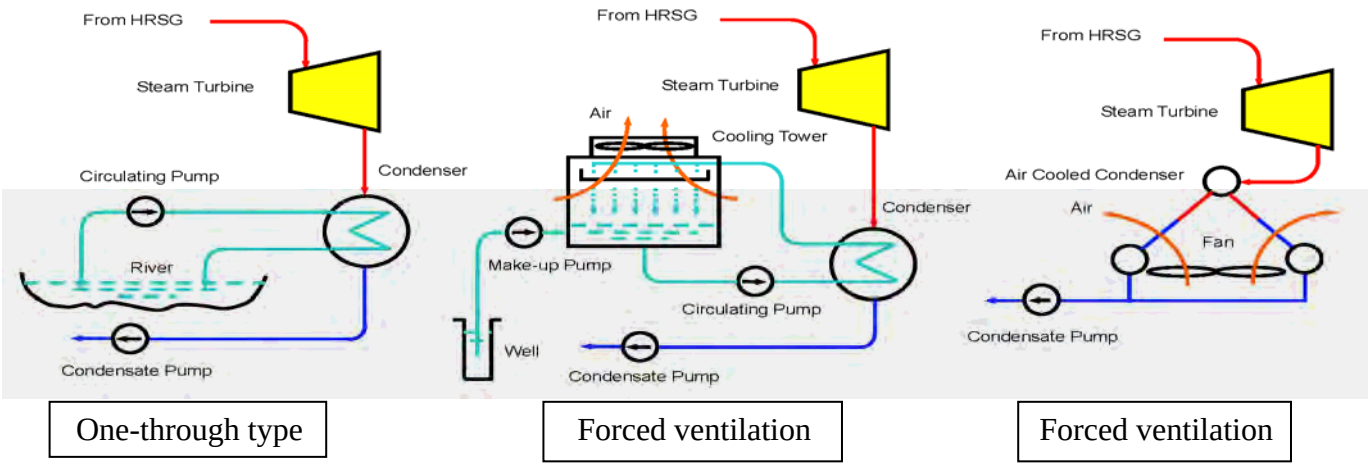


Figure 8.5.3-1 Outline of the major condenser cooling system

The result of the consideration is shown in Table 8.5.3-1. The use of air-cooling system has no actual achievement in the past in Uzbekistan, and in conclusion the forced-draft cooling-tower cited in the EIA was adopted.

Table 8.5.3-1 Comparison of the cooling system

Items	**Forced-draft cooling tower system**	Forced draft air cooling system
Installation expense	Lower cost than the air-cooling system. **(17.5 million $)**	Higher cost than the air-cooling system (21.2 million $)
Water quality management	Water quality management of the utility water is necessary.	**Utility water is not necessary.**
Installation space	**Smaller than air cooling system (2,080m^2)**	Larger than cooling tower system (4,800m^2)
Heat efficiency	**Slightly higher than air cooling system**	Slightly lower than cooling tower system
Effluent	Blow-down is generated (240m^3/h)	**No effluent is generated.**
Noise	Noise is generated: 85dB	Generated: 85dB
Actual performance in Uzbekistan	**Practically used in CCCGP No.1 etc.**	No practical performance

Note: bold letter: advantage

8.6 Environmental management plan (mitigation measures)

8.6.1 Environmental management plan during construction phase

1) Implementation system

At the construction phase, the PIU of the SJSC Uzbekenergo and Navoi Power Plant shall carefully consider the construction activity with supervision consultant and encourage the EPC contractor to well understand the necessary mitigation measures and to implement them.

In this regard, an environmental management unit shall be organized prior to the construction activity and an expert environmental management administrator shall be placed. The unit will discuss and prepare the mitigation measures with supervision consultant and the EPC contractor prior to the construction activity.

During construction activity in which large inflow of workers and vehicles is predicted, the environmental management unit shall cooperate with Navoi power plant in promoting the understanding of the surrounding community about the contents and schedule of the construction activity and mitigation measures, collecting the local people's opinion and correcting the mitigation measures as appropriate.

In order to confirm the implementation of the environmental management and to consider further mitigation measures, the EPC contractor should submit a regular report to the Supervision consultant and environmental management unit on the implementation status of the management plan.

The environmental management administrator shall regularly conduct explanation to the local people and submit a report to the State Committee for Nature Protection, JICA and other relevant organizations about the implementation status of the environmental management, in addition to the environmental monitoring described hereinafter.

Figure 8.6.1-1 describes the environmental management and monitoring implementation structure with the reporting flow in construction phase.

2) Mitigation measures

The major environmental impact, mitigation measures, responsible organization, and expense for each environmental item in construction phase is listed in Table 8.6.1-1.

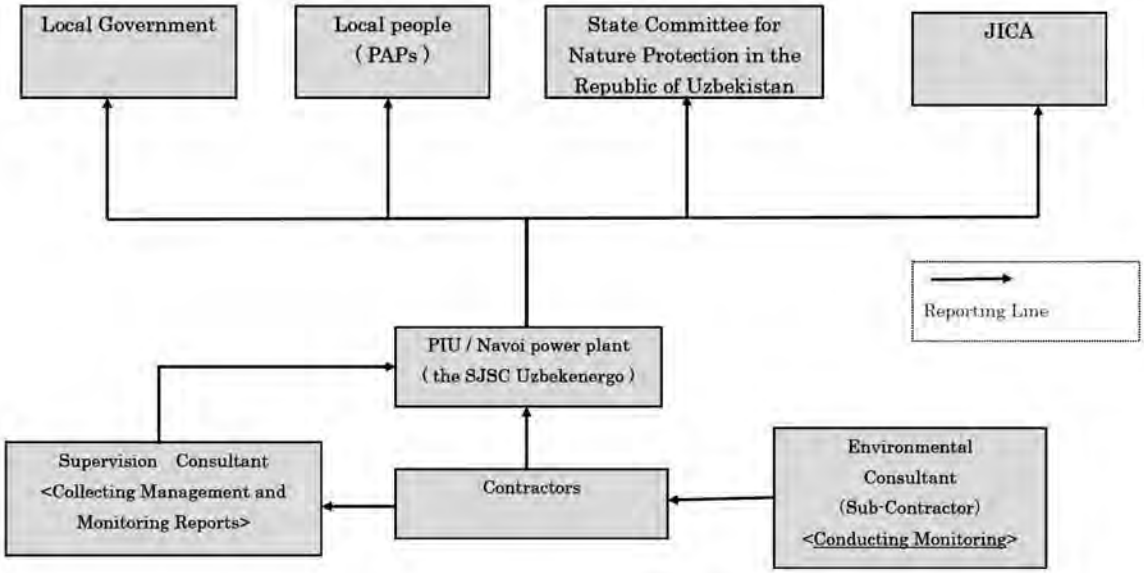


Figure 8.6.1-1 Environmental Management and Monitoring Implementation Structure in Construction Phase

Table 8.6.1-1 Major environmental impact during construction phase and mitigation measures

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
Air pollution	Temporary emission of air pollutants (Sox, NOx, etc) from heavy machines and vehicles and flying dust may occur.	- Periodic check up and maintenance of vehicles. - Shutdown of engine during waiting time. - The rear deck of the sand-transport trucks shall be covered. Periodic car wash. - Periodic car wash - Periodic watering of the site and surrounding road in case of strong wind. - Monitoring of ambient air in the residential area compared to the standard of Uzbekistan and IFC/WB EHS guidelines.	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor. Watering equipment cost.
Water pollution	Muddy water after rain, domestic wastewater generated by workers is temporarily generated.	- Installation of temporary rainwater drainage. - Installation of temporary sedimentation pond and oil-separating system - Storage of waste oil and chemical materials in a storage site and method to prevent permeation into ground. - Installation of septic tank and temporary toilet. - Monitoring of river water quality compared to the standard of Uzbekistan	continuously	- Implementation: EPC Contractor/ Environmental Consultant -Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor. -Installation cost of rain drainage and sedimentation pond - Installation cost of oil-separating system - Installation cost of temporary toilet
Waste	Domestic waste, waste oil, waste material will be generated.	- Development of waste management program including education of workers to encourage reduction and reuse of waste. - Prohibition of illegal dumping. - Separation of waste by waste type, storage in an appropriate storage site and legal disposal in an appropriate disposal site.	continuously	- Implementation: EPC Contractor -Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor. - Installation of waste separation cases - Contract cost with waste disposal company
Noise and vibration	Temporary noise from the construction machines and vehicles will be generated.	- Periodic check up and maintenance of vehicles. - Construction activity and traffic of vehicles is essentially limited to daytime. - Use low-noise/vibration type equipment - Temporary soundproof wall around the project site. - Monitoring of Noise level at site boundary and the residential area compared to the standard of Uzbekistan and IFC/WB EHS guidelines.	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor. -Installation cost of soundproof wall.

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
Terrestrial ecosystem	Air pollution, noise and vibration may be generated during construction.	- Implementation of mitigation measures for air pollution, noise and vibration.	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
River ecosystem	Water turbidity caused by construction work.	- Implementation of mitigation measure for water pollution		- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
Resettlement	Land acquisition of 22ha for construction of transmission line and road will result in resettlement of 33 households.	- Development of livelihood restoration measure with appropriate compensation and support. - Monitoring of the local residents shall be conducted. - Establishment of grievance system.	continuously	District administration / Navoi Thermal power plant	Expense is to be paid by Uzbekenergo
Employment and livelihood	Income gap between the project workers and the local people may occur.	- Priority in employment of local people, especially project-affected people. - Provision of job training for employment	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
Local society	-Influx of workers may generate infectious disease, HIV, conflict with local people. -Influx of workers and their family may require establishment of social infrastructure such as medical facility, schools, road, sewage line, etc. -Increase of traffic and damage of the	- Development of safety and sanitation management plan and implementation of regular medical checkup. -The workers will have a medical examination every year - Development of necessary infrastructures for the contractor's mobilization area according to the EPC contract. - Slowdown of vehicles in the residential and school area. - Traffic of construction vehicles during school commuting hours shall be avoided. - Checking of traffic regulations, installation of traffic signs, driving safety education, speed restriction, checkup of vehicle equipment (brake, klaxon).	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor. - Installation cost of traffic signal and signs. - Repair cost of roads.

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
	road in the surrounding area.				
Labor environment	- There is a risk of labor accident of workers. - There is a risk that security agents threaten the security of the local people.	- Development of safety and sanitation management plan and implementation of regular medical checkup. - Restriction of long-time exposure to noise for workers. - Personal protective gear shall be used. - Construction of medical facility on the working site with nurse. - Establishment of cooperative relationship with the local medical facilities.	continuously	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
Global warming	Temporary emission of CO_2 from heavy machines and vehicles.	-Rationalization of construction schedule: minimization of heavy machine operation and material transportation.	Before starting construction activity	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.

8.6.2 Environmental management plan during operation phase

1) Implementation system

Navoi power plant is responsible for organizing an environmental management unit to develop and implement the environmental management plan as a mitigation measures.

An expert environmental management administrator shall be placed so that the environmental management plan is appropriately implemented.
The environmental management administrator shall enhance the understanding of the environmental management plan to the project staff prior to the operation, and continue regular education of the staff during operation phase.

The environmental management unit shall also function as a grievance organization to understand and address the grievance from the local people during operation phase, and conduct appropriate mitigation measures.

Basic policy of the environmental management plan is to coordinate with the local community, and sufficient explanation of the positive mitigation measures for the local people is very important. Inviting the local residents and school children to a visiting tour of the high-technology power station in the future may be useful.

The administrator shall report the contents and implementation status of the environmental management plan and the environmental monitoring plan described below to the director of the plant, with the director taking final responsibility.

The environmental management administrator shall regularly conduct explanation to the local people and submit a report to the State Committee for Nature Protection, JICA and other relevant organizations about the implementation status of the environmental management, in addition to the environmental monitoring described hereinafter.

Figure 8.6.2-1 describes the environmental management and monitoring implementation structure with the reporting flow in operation phase.

2) Mitigation measures

The major environmental impact, mitigation measures, responsible organization, and expense for each environmental item in operation phase are listed in Table 8.6.2-1.

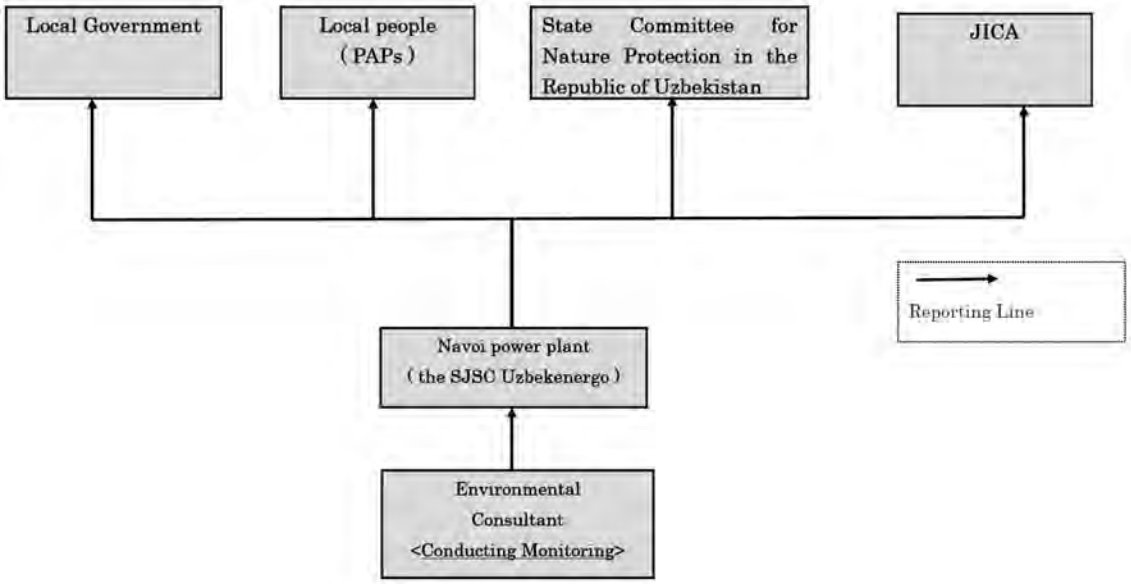


Figure 8.6.2-1 Environmental Management and Monitoring Implementation Structure in Operation Phase

Table 8.6.2-1 Major environmental impact during operation phase and mitigation measures

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
Air pollution	Very little SO_2 and soot is generated from the gas turbine, but NO_2 and other NOx is emitted.	- Use of natural gas - Introduction of low NOx combustion appliances - Use of high stack - Gas emission with high speed (reducing the chance of emission gas blowing downward caused by high wind speed, which is called down-wash phenomenon) -Not constructing high building downstream of the wind direction from the stack location. (reducing the chance of emission gas blowing downward caused by high building, which is called down draft phenomenon - Monitoring of exhaust gas and ambient air in the residential area compared to the standard of Uzbekistan and IFC/WB EHS guidelines.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Water pollution	Cooling tower blow-down and washing wastewater from water demineralizer will be generated.	- Installation of water treatment facility. - Drain system will be introduced to gather oily rain water. - Monitoring of waste water and river water compared to the standard of Uzbekistan and IFC/WB EHS guidelines.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Waste	Waste oil, sludge, domestic waste will be generated.	- Development of waste management program including education of workers to encourage reduction and reuse of waste. - Prohibition of illegal dumping. - Return waste oil to the suppliers to treat it appropriately. - Separation of waste by hazard level, storage in an appropriate sites and legal disposal in an appropriate disposal site.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Noise and vibration	Noise from cooling tower fan, turbine and pumps is predicted.	- Use low-noise equipment. - Use of GT enclosure, GT intake silencer, louver for cooling tower, turbine building、 - Use of low-vibration equipment - Construction of buildings with strong foundation. - Regular maintenance of the equipment. - Tree-planting and installation of sound proof wall around the project site if needed.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
		- Monitoring of Noise level at site boundary and the residential area compared to the standard of Uzbekistan and IFC/WB EHS guidelines.			
Terretrial ecosystem	Air pollution and noise/vibration resulting from power generation will cause negative effect to terrestrial organisms.	Implementation of mitigation measure for air pollution, noise/vibration.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
River ecosystem	Water turbidity may be caused by power generation activity.	- Water pollution mitigation measures shall be conducted.		Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
resettlement	Land acquisition of 22ha for construction of transmission line and road will result in resettlement of 33 households.	- Development of livelihood restoration measure with appropriate compensation and support. - Monitoring of the local residents shall be conducted. - Establishment of grievance system.	continuously	District / Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Employment and livelihood	Income gap between the project workers and the local people may occur.	- Priority in employment of local people, especially project-affected people. - Provision of job training for employment	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Local society	- Influx of workers may generate infectious disease, HIV, conflict with local people. - Influx of workers and their family may require establishment of social infrastructure such as medical	- Development of safety and sanitation management plan and implementation of regular medical checkup. - Slowdown of vehicles in the residential and school area. - Traffic of vehicles during school commuting hours shall be avoided. - Checking of traffic regulations, installation of traffic signs, driving safety education, speed restriction, checkup of vehicle equipment (brake, klaxon).	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant

Items	Potential impact	Mitigation measures	Frequency	Responsible organization	Expense
	facility, schools, road, sewage line, etc. - Increase of traffic and damage of the road in the surrounding area.				
Labor environment	- There is a risk of labor accident of workers. - There is a risk that security agents threaten the security of the local people	- Development of safety and sanitation management plan and implementation of regular medical checkup. - Restriction of long-time exposure to noise for workers. - Personal protective gear shall be used. - Establishment of cooperative relationship with the local medical facilities. - Development of gas-leakage prevention management plan. - Gas-leakage alarm system - Installation of stationary fire prevention system, fire hydrant, fire extinguisher, fire escape exit, fire alarm, fireproof compartment, emergency exit, etc. - Installation of automatic control system.	continuously	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant
Global warming	Yearly CO2 emission will be reduced compared to an average power plant in Uzbekistan.	- Adoption of high-efficiency combined cycle power generation system and maintenance of capacity of the facility.	Prior to the construction.	Navoi Thermal Power Plant	Uzbekenergo/ Navoi Thermal Power Plant

8.7 Environmental monitoring plan

The details of the environmental monitoring plan during construction and operation phase is shown in Table 8.7-1, and the overview is described below. Environmental management and monitoring implementation structure with the reporting flow is described in Chapter 8.6.

8.7.1 Construction phase

1) Air quality monitoring
NOx（NO, NO_2） and Suspended particles (dust) are used as parameters.
The Monitoring location is a residential area in the vicinity. Monitoring of schools, hospitals and other environmentally sensitive sites may also be considered.

2) Noise monitoring
Noise level is used as a parameter.
The monitoring location is the boundary of the power plant site and the residential area in the vicinity. Monitoring of schools, hospitals and other environmentally sensitive sites may also be considered.

3) River water quality monitoring
TSS, pH, Oil & grease are used as parameters.
The monitoring location is the point in Zerafshan River around the outlet of wastewater from temporary sedimentation pond.

4) Waste
Waste management practice in storage and disposal are used as parameter.
The monitoring location is project site and camp and service facility for worker.

8.7.2 Operation phase

1) Exhaust Gas emission monitoring
NOx (NO, NO_2) is used as a parameter.
The monitoring point is gas ducts

2) Wastewater monitoring
Measurement parameter shall be based on the Uzbekistan regulations and IFC EHS Guidelines Thermal power plant (2008).
The monitoring points are the outlet of the wastewater treatment system for cooling tower blow-down and reclaimed waste water from the water demineralizer.

3) Air quality monitoring
NOx (NO, NO_2) is used as a parameter.
The monitoring points are essentially the existing monitoring points. Monitoring of schools, hospitals and other environmentally sensitive sites may also be considered.

4) Noise monitoring
Noise level is used as a parameter.
The monitoring points are essentially the project site boundary and the residential area in the vicinity. Monitoring of schools, hospitals and other environmentally sensitive sites may also be considered.

5) River water quality monitoring
Measurement parameter shall be based on the Uzbekistan regulations
The monitoring location is the point in Zerafshan River around the existing outlet of wastewater.

6) Waste
Waste management practice in storage and disposal are used as parameter.
The monitoring location is project site.

Table 8.7-1 Items, location, method, frequency, responsibility and expense of the environmental monitoring plan

Classification	Item	Parameter	Method	Location	Frequency	Responsibility	Expense
Construction phase	Air quality	Nox (NO, NO_2), Suspended particles (Dust)	Automatic mobile ambient air quality analyzers	2 point: west and south residential area in the vicinity	- Quarterly - Once a week at the time	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/Navoi Thermal power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
	Noise	Noise level	Sound-level meter	2 point :project site west and south boundary 2 point:west and south residential area in the vicinity	- Quarterly - Once a week at the time	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/ Navoi Thermal power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
	River water quality	TSS, pH, Oil	- Analysis by sampling	2 point: in Zerafshan River, 100m upstream and 100m downstream of the outlet of waste water from temporary sedimentation pond.	- Quarterly	- Implementation: EPC Contractor/ Environmental Consultant - Supervisor: PIU/ Navoi Thermal power plant/Supervision Consultant	Expense is included in EPC contract cost by EPC Contractor.
	Waste	Waste management practice in storage and disposal	- Contract and record	- Project site and camp and service facility for worker.	-Continuously	- Implementation: EPC Contractor -Supervisor: PIU/ Navoi Thermal power	Expense is included in EPC contract cost by

Classification	Item	Parameter	Method	Location	Frequency	Responsibility	Expense
						plant/Supervision Consultant	EPC Contractor.
	Grievances	Numbers, contents, and processing results of grievances	Record	Navoi Thermal Power Plant	-Continuously	Navoi Thermal Power Plant / Karamana Khokimiyat	Navoi Thermal Power Plant/PIU
Operation phase	Exhaust gas	NOx	Continuous. Emission Monitoring System(CEMS)	Gas duct	-Continuously	Navoi Thermal power plant	CEMS: Expense is included in EPC contract cost by EPC Contractor.
	Waste water	Temperature , pH, SS., Oil, DO, Nitrite, Nitrate, Sulfate, Chloride, Ca, Mg, Residual chlorine, Cr, Cu, Fe, Zn, Pb, Cd, Hg	- Analysis by sampling	Outlet of waste treatment facility	-Quarterly	Navoi Thermal power plant	Navoi Thermal power plant
	Air quality	NOx (NO, NO_2)	- Automatic ambient air quality analyzer and recorder	1 point:west residential are 2km from site	-Quarterly - Once a week at the time	Navoi Thermal power plant or Environmental Consultant	Equipment 80,000$ （Consultant）50,000$/year
	River Water quality	Temperature, pH, DO, BOD, SS, Oil, Ammonia, Nitrite, Nitrate, Sulfate, Phenol, Chloride,	- Analysis by sampling	2 point: in Zerafshan River, 100m upstream and 100m	- Quarterly	Navoi Thermal power plant	Navoi Thermal Power Plant

Classification	Item	Parameter	Method	Location	Frequency	Responsibility	Expense
		Ca, Na, K, Phosphate, Fe, Cu, Zn, Cr, Pb		downstream of the existing outlet of wastewater. (the current monitoring points)			
	Noise	Noise level	Sound-level meter	2 point :project site west and south boundary 2 point:west and south Residential area in the vicinity	Twice a year	Navoi Thermal power plant or Environmental Consultant	Navoi Thermal Power Plant
	Waste	Waste oil, sludge, domestic waste	Record	Storage sites	Twice a year	Navoi Thermal Power Plant	Navoi Thermal Power Plant
	Grievances	The numbers, contents, and processing results of grievances	Record	Navoi Thermal Power Plant	Everyday	Navoi Thermal Power Plant / Karamana Khokimiyat	Navoi Thermal Power Plant

8.8 Stakeholder meeting and others

8.8.1 EIA explanation meeting

The public consultation has been held on 10 January 2012. In this meeting, the explanation about the project component and the result of EIA has been given to the attendants. There was no record of questions or comments on the compensation or livelihood restoration plan posed from the attendants. However, the meetings regarding resettlements have been held several times (see 8.8.4) (EIA p.3, 6 Pre-Feasibility Study Appendix 7).
52 people attended this meeting. They were the representatives of the residents and the local village office in Yangiobod Village and Uyrot Village in Karmana District in Navoi area. The details of the 52 attendants are as follows (EIA Appendix 7).

Residents of Yangiobod Village: 20
Residents of Uyrot Village: 18 (including the village mayor)
OJSC Navoi TPS: 7
OJSC Teploelektroproekt: 4
Transcriber: 1
Independent: 2

All the attendants of the meeting showed agreement by Prepared Questionnaire to the project, and there was none against the project (EIA Appendix 7).
Main items of Questionnaire are as follows

1) Full Name
2) Address
3) How do you evaluate the environmental status in your residential district? :
   atmospheric air (good, satisfactory, bad)
   water (good, satisfactory, bad)
   vegetation (good, satisfactory, bad)
4) Do you think that the quality of the environment affects your and your children's health?
   (yes, no, don't know)
5) Do you know about the forthcoming construction of 450MW CCGT unit construction at Navoi TPS? (yes, no)
6) Do you know that environmental impact assessment of 450MW CCGT unit construction at Navoi TPS has been conducted? (yes, no)
7) Have you received information about the results of environmental impact assessment of 450MW CCGT unit construction at Navoi TPS has been conducted?
   (yes, no, if yes, when, where and from whom)
8) Do you expect any environmental improvement (atmospheric air, soil, vegetation) and better health after 450MW CCGT unit construction at Navoi TPS?
   (yes, no, don't know)
9) Do you expect any improvements in your life after 450MW CCGT unit construction at Navoi TPS? (yes, no, don't know)
10) Do you object to 450MW CCGT unit construction at Navoi TPS?
11) Your comments and wishes

The attendants did not reply most of the questions (No.3-10) of the Questionnaire but simply replied that they agreed to the project. It is assumed that the attendants did not have much environmental concern in principle, and if any, all the necessary clarifications and comments were made at the last part of the meeting.

Questions and comments	Answers from project owner
When will CCGT450MW be constructed and start operation? < Uyrot villager>	It is not officially determined yet. We hope to start as soon as possible.
Does CCGT operation make noise in my house? < Yangiobod villager>	According to the example of the existing power plant, noise level will be below the environmental standard.
Will CCGT be added to the existing power plant, or will it replace the old ones? < Chair of Uyrot village>	The existing power plant Unit 3 and 8 will be shut down after CCGT starts operation. These are more than 40 years old.
How old is the existing 2 boilers to be decommissioned? < Yangiobod villager>	
Why does CCGT cause less environmental impact compared to the existing units? <Chair of Yangiobod village>	Because CCGT has higher generation efficiency and less environmental impact.

8.8.2 Supplementary Interview with Affected People

Interview with the families in Uyrot and Yangiobod villages were conducted on 30 August 2012 to supplement stakeholder meetings held by the project owner because it was not quite sure whether opinions from the residents were properly obtained at the public meeting on 10 January 2012.
Interviewees were two families in Uyrot village and two families in Yangiobod village, which were selected at random.

1. Uyrot village

(1) First family:
The number of family member:5 person (parents and 3 children)
Residence year: 5 years
Main income source:: Salary from Navoi TPP
Other incomes: 0.08ha fruit garden and two cows
Other:

- Electricity and tap water are available.
- It takes 15 minutes on foot to go to school.
- They knew that EIA explanation meeting was held and know that they have to remove to the resettlement area.
- They agree with resettlement. However they would like to be informed about monetary compensation price (they have signed the census paper to show agreement of resettlement).
- As of CCGT Unit 1 construction, they mind noise, vibration and dust from traffic.

(2) Second family:
The number of family member：5 person (parents and 3 children)
Main income source: livestock, 2 children working at Navoi Power Plant and 400,000 Uzbekistani sum (16,000 JPY) of monthly pension for retired parents.
Other:

- Electricity and water supplied at house.
- Informed about the resettlement, and heard about resettlement several times since

January this year. However, not yet known about the compensation process nor resettlement site.
- −Informed that stakeholder meeting for EIA was held.
- −Clinics located close to the house.
- −Gas supplied at the house, but sometimes not used during winter season.
- −Concerned about noise pollution during construction of CCCGP No.1

2. Yangiobod village

(1) First family:
The number of family member：3 person（parents and 1 child）
The number of residing years：2year
Main income source：Working for electricity supply company as an accountant
Other:
- −Electricity and water supplied at house, but gas is not supplied
- −No house to live in until new house is constructed, if the present house is demolished.
- −Visited by local government officer to discuss with residents about resettlement.
- −Concerned about noise pollution during construction of CCCGP No.1
- −Informed that stakeholder meeting for EIA was held.

(2) Second family
The number of family member：6 person（parents and 4 children）
The number of residing years：5year
Main income source：Working for Navoi Power Plant
Other:
- −Electricity and water supplied at house. Gas can be used during summer, but not in winter.
- −20 minutes of walk to school from house
- −Concerned about noise pollution and dust caused by vehicles during construction of CCCGP No.1
- −Informed that stakeholder meeting for EIA was held.

8.8.3 Additional Stakeholder meeting on Environmental and Social Consideration

Additional Stakeholder meeting was held at recreation room adjacent to Navoi CCCGP No.1 on October 30, 2012 by the project owner with help from the survey team. This is because JICA's Guideline was not included in the explanation and it was not quite sure whether opinions from the residents were properly obtained at the public meeting on 10 January 2012.
Affected residents were not notified of the meeting through their representative. In addition, the stakeholder meeting was publicized in the newspaper as well. The Director of Navoi thermal power station explained outline of project, objective and contents of Stake Holder Meeting to residential people who participated in the meeting. After the Director's speech, JICA Guidelines for Environmental and Social Consideration, Environmental Management Plan, Environmental Monitoring Plan and Land Acquisition and Resettlement Action Plan for this project were briefly presented. Main questions from the participants were related to resettlement plan. The detail of the meeting is as follows;

Place of meeting: Recreation Room in Navoi CCCGP No.1's camp site
Method of notification to residential people: informing neighboring residents through their representatives and newspaper.

Number of participants: 52 people

resettled residents	34
Navoi Region, Karmana District, Hokim (Major)	1
Karmana District, Makhalla “Yangiobod”, Posbon (Commissary)	1
Karmana District, Rural Citizen Assembly “Yangiobod”, Chairman	1
Karmana District, Makhalla “Uirot”, Chairman	1
Karmana District, Makhalla “Yangiobod”, Chairman	1
Karmana District, Makhalla “Yangiobod”, Female Issues Consultant	1
Karmana District, Makhalla “Yangiobod”, Secretary	1
Karmana District, Chief of Land and Assets Cadaster	1
Karmana District, Deputy Chief of Architecture and Construction Department	1
Staff of Navoi TPP	9

1. Opening remarks, the project description -Director of Navoi TPP (09.20).
2. Presentation of the project – JICA’s study team (09.40).
3. Speech by Governor of Karamana District, Navoi Region (10.45).
4. Questions and answers. Discussion with residents to be resettled. (11.00).

Main speech, questions and answers are the following;

Speakers;	Contents;
The first speech <pensioner from makhalla "Uyrot">	Supports modernization of Navoi TPP because it will give new energy to the development of the economy of Navoi region and the country as a whole
Answer <Project Owner>	We appreciate your support.
The second speech < Representative of the residents, who did not introduce himself.>	Residents have no objection to the new project. He expressed dissatisfaction with the fact that the evaluation of their homes was made with earlier date of construction, which makes the value of their homes lower than it should be.
Answer < Governor>	The problem can be solved. Compensation money for resettled residents can be paid "even today". But then, the residents will have to relocate in the cold season. So he proposed them that they begin construction on new allocated sites today at their own expense. Compensation money will be paid in spring, so that they could start construction the main building.
The third speech <Residents>	We prefer to get monetary compensation by cash rather than by bank remittance.
Answer <Project owner>	According to the law, we cannot provide monetary compensation by cash.

It is alleged as of November 2012 that the owners of 10 houses under construction in Yangiobod village are not to be eligible for compensation. Therefore the 10 houholds appealed to Mayor of Karamana District and Navoi TPP to receive the compensation.

8.8.4 Stakeholder meetings related to resettlement

The following is a Summary of stakeholder meetings on resettlement. Project Owner made several meetings in order to obtain consent from the residents. Finally, all resettlement households agreed with the relocation to new places.

Summary of Project Consultations (LARAP page26-28);

1st

Date and Time	December 20th, 2012
Language	Uzbek
Attendance	Representatives of Makhalla Representatives of District Managing Director of Navoi HES 31 affected households (The other 2 households did not attend this meeting. These households are about to start constructing houses, not residing at this moment.)
Agenda	Project Description Land Acquisition and resettlement
Remarks	

2nd

Date and Time	February, 2012
Language	Uzbek
Attendance	Navoi State Governor Representatives of Makhalla Representatives of District Managing Director of Navoi HES 33 affected households
Agenda	Compensation to the affected households
Remarks	- Navoi State Governor explained to the affected households that 33 households were not entitled to receive compensation since they are illegal residents. - Navoi State Governor, however, decided to provide compensation to the affected households because of the complaints from the residents.

3rd

Date and Time	May, 2012
Language	Uzbek
Attendance	Navoi State Governor Representatives of Makhalla Representatives of District Managing Director of Navoi HES 33 affected households
Agenda	Compensation to the affected households
Remarks	- Resolution was issued, and only residents that are actually residing in the affected properties are entitled to receive compensation. - Uzbekenergo hired an independent agency for evaluating replacement cost of buildings, and the cost survey started in July.

4th

Date and Time	August 29th, 2012
Language	Uzbek
Attendance	Representatives of Makhalla Staff of Navoi HES JICA's study team members Special Commission on determining the amount of the compensation and type of compensation for the citizen (Chairman of local resettlement, Uyrot Village Citizen's Gathering, Chairman of local residential area "Yangiobod", Chairman of local residential area "Uyrot"), Deputy of Navoi HEP
Agenda	Explanation of JICA project Progress of resettlement
Remarks	- Real estate agency has been conducting asset inventory survey at each affected household. The survey on 12 households to be relocated in Uyrot village has already been finished, and approval signatures on the survey result have been acquired. The survey on the remaining 11 households in Yangiobod village will be completed by September 10th. - The resettlement site will be prepared about 2km away from the power plant site. - One household receives 600m^2 of land at the resettlement site, totaling 4.4ha of land been prepared. - The procedure of the resettlement is as follows: 1) notifying the residents, 2) conducting social survey, 3) acquiring residents' approvals on asset inventory survey and the survey result, 4) calculating compensation cost, 5) paying compensation, 6) preparing land by local government, 7) constructing houses by residents, 8) relocating to the new site. - Consultation to the residents has been conducted since NO.16-68 was issued on December 27th, 2011. - Compensation will be paid based on the market price. - The alternative site located north of the existing power plant has about 400 summer houses (temporary residential houses) and about 200 permanent residential houses.

8.9 Brief resettlement Action plan

8.9.1 Analysis of the legal framework concerning land acquisition and resettlement

Refer LARAP VII.LEGAL FRAMEWORK

8.9.2 Necessity of land acquisition and resettlement

Refer LARAP III.SCOPE OF LAND ACQUISITION AND RESETTLEMENT

8.9.3 Implementation of socioeconomic survey concerning land acquisition

1) Population census survey
Refer LARAP IV.SOCIOECONOMIC INFORMATION AND PROFILE, IV.1. Economic and Social Development in Navoi Province and Karmana District

2) Property/estate survey
Refer LARAP I.EXECUTIVE SUMMARY, I.2.Summary of Impacts

3) Household finance/life survey
Refer LARAP IV.SOCIOECONOMIC INFORMATION AND PROFILE, IV.3. Project Census

8.9.4 Requirement of compensation for lost assets and livelihood restoration

1) Compensation of lost assets
Refer LARAP VIII.ENTITLEMENTS, ASSISTANCE, AND BENEFITS, VIII.1.Entitlements for Compensation, VIII.2.Formalization of Title/Registration, VIII.3.Calculation of Compensation

2) Livelihood restoration
Refer LARAP VIII.ENTITLEMENTS, ASSISTANCE, AND BENEFITS, VIII.5. Entitlement Matrix

8.9.5 Grievance system

Refer LARAP VI.GRIEVANCE REDRESS MECHANISM

8.9.6 Implementation system

Refer LARAP XII.INSTITUTIONAL ARRANGEMENTS

8.9.7 Implementation schedule

Refer LARAP XIII.IMPLEMENTATION SCHEDULE

8.9.8 Cost and funding

Refer LARAP XI.RESETTLEMENT BUDGET AND FINANCIAL PLAN

8.9.9 Monitoring system/monitoring form

Refer LARAP XIV.MONITORING AND REPORTING

8.10 Other

8.10.1 Environmental Checklist

Table 8.10.1-1 shows the result of environmental and social consideration reviewed according to the checklist attached to JICA Guideline.

Table 8.10.1-1 Environmental Checklist

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
1 Permits and Explanation	**(1) EIA and Environmental Permits**		
	(a) Have EIA reports been officially completed?	**The EIA report was completed.** ・The EIA of this project has been prepared in accordance with the laws of the country concerned.	**Y**
	(b) Have EIA reports been approved by authorities of the host country's government?	**The EIA report have been approved by the Uzbekistan government** ・The EIA was approved on February 21, 2012 by the National Nature Protection Committee.	**Y**
	(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	**Project owner prepared another EIA, which has been approved by the committee.** ・Project owner once submitted an EIA draft of CCCGP2 to the National Nature Protection Committee. As a result of the review, however, the committee ordered us to conduct another EIA on November 23, 2011. ・The major reasons were the EIA failed to study on the impact from pollutants and the risk of gas explosion, including new CCCGP1 and CCCGP2 facilities and discontinuance of existing 1 and 2 units and 3 and 8 units. ・To meet the order, project owner prepared another EIA, which has been approved by the committee.	**Y**
	(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	**Environmental permits other than EIA have not been obtained yet, and these will be approved till operation.** ・Project owner is required to submit draft notice on Environmental impact consequence to the State Ecological Expertise before operation In this procedure, all permit will be obtained	**N**
	(2) Explanation to the Stakeholder		
	(a) Are contents of the project and the potential impacts adequately explained to the stakeholder based on appropriate procedures, including information disclosure? Is understanding obtained from the stakeholder?	**The public consultation shall be conducted.** **＜EIA explanation meeting＞** ・Project owner held a meeting on explaining this project on January 10, 2012 at the Karmana District in the Navoi area. The meeting was attended by local residents of the Yangiobod village and the Uyrot village and representatives of the village offices. The number of the attendees totaled 52. (EIA p.3, 6, Pre-Feasibility Study Appendix 7). ・According to the meeting minutes, the attendees were in favor of implementing this project. No attendees were against this project. (Pre-Feasibility Study Appendix 7). **＜Additional Stakeholder meeting＞** ・Additional Stake Holder Meeting was held at recreation room adjacent to Navoi CCCGP No.1 on October 30, 2012 by the project owner with helping by the survey team. This is because JICA's Guideline was not included in the explanation and it was not quite sure whether opinions from the residents were properly obtained at the public meeting on 10 January 2012. ・The stakeholder meeting was notified to the affected residents through the representative of the residents, as well as by newspaper. ・Director of Navoi thermal power station explained outline of project, objective and contents of Stake Holder Meeting to residential people who participated the meeting. Then, JICA Guidelines for Environmental and Social Consideration, Environmental Management Plan, Environmental Monitoring Plan and Land Acquisition and Resettlement Action Plan for this project were briefly presented.	**Y**

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="2">1 Permits and Explanation</td><td>(b) Are proper responses made to comments from the stakeholder and regulatory authorities?</td><td>The comments of the local people collected at the public consultation were all answered by the project owner.
・At the meeting held on January 10, 2012 for local residents, Project owner answered all the questions and comments made by the attendees. (Pre-Feasibility Study Appendix 7)
Questions and answers were described as follows:
<table><tr><th>Question and opinion</th><th>Answer</th></tr><tr><td>When will CCCGP450MW start construction and operation?</td><td>The time is not decided officially. However, we would like to start operation at our earliest convenience.</td></tr><tr><td>Will CCCGP operation cause noise in the surroundings of houses?</td><td>The noise level will be lower than the standard in reference to cases of existing power plants.</td></tr><tr><td>Will CCCGP be added to the existing facilities, or will the existing facilities be replaced by CCCGP?</td><td rowspan="2">CCCGP will replace existing Nos. 3 and 8 plants and their operations will be discontinued because they were built more than 40 years ago.</td></tr><tr><td>How old are the existing two boilers to be discontinued?</td></tr><tr><td>Why will CCCGP have less impact on the environment, compared with the existing plants?</td><td>CCCGP has higher efficiency of power generation, which will result in less impact on the environment.</td></tr></table></td><td>Y</td></tr>
</table>

<table>
<tr><th colspan="3">Main Check Items</th><th colspan="3">Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="3">1 Permits and Explanation</td><td colspan="2">(3) Alternatives</td><td colspan="3"></td><td></td></tr>
<tr><td colspan="2">(a) Were any alternatives of the project plan, including the environmental social items, examined</td><td colspan="3">EIA report and JICA Mission Team provides consideration of alternatives concerning the zero option, site selection and cooling system.
< Zero option>
・In the case where CCCGP No.2 is not constructed and the existing old-type power plants (Unit 3 and Unit 8) continue operation, the air quality around the plant area will remain in a bad condition, the reliability of the facility will decrease and the risk of accident will increase. （EIA p.67）
< Site selection >
・In the EIA, the north end of the existing power plant site is considered as an alternative site for constructing CCCGP No.2.
・However, further consideration of this plan was called off for the reasons described in the table below.
・The current proposed site facing the west of CCCGP No.1, even though resettlement of 33 households is predicted, is considered the most favorable alternative.

Comparison of the alternative site
<table><tr><th>Item</th><th>The north end of the existing power plant site （Site A）</th><th>The site facing west of CCCGP No1 (proposed site) (SiteB）</th></tr><tr><td>Technics</td><td>-Construction of gas supply facility is necessary within the operating plant site and the construction activity involves high risk.</td><td>-New site and low risk for construction of gas supply facility.</td></tr><tr><td>Topology</td><td>-Not enough space for construction activity.
-Not enough space for constructing a storage facility.</td><td>-Enough space for construction activity.
-Enough space for constructing a storage facility.</td></tr><tr><td>Resettlement</td><td>-Destruction and resettlement of the existing 200 living houses and 400 summer house within the site is predicted.</td><td>-There are no houses within the site and no resettlement is predicted.
-There are 23 houses and bases of 10 houses within Transmission line route.</td></tr></table></td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
1 Permits and Explanation	(b) Were any alternatives of the project plan, including the environmental social items, examined?	＜**Cooling system for the condenser**＞ ・While the condensers in the existing power plants, except Unit 11 and 12, adopt one-through system, either forced draft cooling tower system or forced draft air cooling system will be adopted in the CCCGPNo.2 power plant. The result of the consideration is shown in Table. The use of air-cooling system has no actual achievement in the past in Uzbekistan, and in conclusion the forced-draft cooling-tower cited in the EIA was adopted.	**Y**

Table: comparison of the cooling system

Items	Forced-draft cooling tower system	Forced draft air cooling system
Installation expense	Lower cost than the air-cooling system. **(17.5 million $)**	Higher cost than the air-cooling system (21.2 million $)
Water quality management	Water quality management of the utility water is necessary.	**Utility water is not necessary.**
Installation space	**Smaller than air cooling system** **（2,080m²）**	Larger than cooling tower system （4,800m²）
Heat efficiency	**Slightly higher than air cooling system**	Slightly lower than cooling tower system
Effluent	Blow-down is generated (240m³/h)	**No effluent is generated.**
Noise	Noise is generated: 85dB	Generated: 85dB
Actual performance in Uzbekistan	**Practically used in CCCGP No.1 etc.**	No practical performance

Note: bold letter means advantage

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
2 Mitigation Measures	**(1) Air Quality**		
	(a)Do air pollutants, such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust emitted by power plant operations comply with the country's emission standards? Is there a possibility that air pollutants emitted from the project will cause areas that do not comply with the country's ambient air quality standards?	**The gas emission from CCCGP No.2 meets the gas emission standard in Uzubekistan and satisfies the IFC guideline.** **According to the atmospheric diffusion modeling, the maximum ground concentration of NO_2 from all Navoi power plants will be improved after operation CCCGP No.2 and will comply with the Uzbekistan environmental standard for NO_2 concentration.** **＜Status＞** ・Annual atmospheric survey was conducted in 2010 at three measurement points (residential, industrial and roadside area) in Navoi City by Uzbek Hydro meteorological Institution"Uzgidromet". ・The nitrogen dioxide (NO_2) concentration is 0.015~0.11mg/m^3（30-minute value）, higher than the maximum permissible concentration (MPC) at the maximum level, with annual average of 0.04 mg/m^3. But these values satisfy 1-hour value of the IFC/WB EHS Guideline, In addition, annual average of NO_2 concentration satisfies the annual average value of IFC/WB EHS Guidelines. ・The sulfur dioxide (SO_2) concentration is 0.001~0.009 mg/m^3, which is well below MPC at the maximum level. This value satisfies the 24-hour value of IFC/WB EHS General Guideline. ・It is also predicted that nitrogen dioxide (NO_2) concentration around power plant site will become much lower, since the number of vehicles, which is the generation source of NO_2, around the power plant site is lower than that in Navoi City. Therefore, the NO_2 concentration value around the power plant site is predicted to be about the same as the value（0.015~0.09 mg/m^3）of residential area in Navoi City at most with conservative point of view. **<Emission standard >** ・In the Republic of Uzbekistan, ground concentration of air pollutant discharged from each stack is estimated by a designated method, and the estimated concentration from CCCGP No.2 meet with the standard value. In this project, NOx concentration will be compliant to the Russian standard (GOST 29328-92). This standard value is equivalent to the guideline value for thermal power plant stipulated in IFC/WB EHS Guideline. **＜Prediction＞** ➢ **Impact of CCCGPNo.2** ・The maximum ground concentration (30 min value) from CCCGP No.2 is 9.1μg/m^3 and occurs under the condition that air stability is B, wind speed is 1.0m/s, and this is about 10% of Uzbekistan environmental standard, and about 5 % of IFC/WB guideline 1hour value. NO_2 concentration value in residential area of Navoi City is 90μg/m^3 at the maximum, which exceeds environmental standard of Uzbekistan (85μg/m^3), but it is below 1-hour value of IFC/WB EHS General guideline (200μg/m^3). ➢ **The total cumulative impact of the power plant** ・In case of shutting-down of Unit 3 and 8, NO2 emission is increased to 4,687ton/year compared to 4,636 ton/year before CCCGP No.2 in operation. SO2 is, on the other hand, reduced after CCCGP No.2 in operation. ・In case of shutting-down of Unit 3, 6, 8 and 10, NO_2 emission is decreased to 4,146 ton/ year compared to 4,636 ton/year before CCCGPNo.2 in operation. ・At condition of atmosphere stability B,the maximum ground concentration of NO_2 generated by the operation of the power plant before CCCGP No.2 starts operation is 56.4~62.0μg/m^3, and it becomes 52.6~56.0μg/m^3 after CCCGP No.2 starts operation and Unit3, 6, 8, 10 are shut down. Between 2~9μg/m^3 that will be decreased after CCCGP No.2 started operation compared to before CCCGP No.2 operation in all wind speed. Assuming that the current concentration value around the power plant is the same level (90μg/m^3) as the one in residential area of Navoi city, the concentration value will become about the same as the standard of Uzbekistan, 85μg/m^3, or even lower.	**Y**

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="2">2 Mitigation Measures</td><td></td><td>・In the case of shutting down of Unit 3 and 8, the maximum ground concentration becomes 58.4~62.μg/m^3. These concentration values are same level after operation of CCCGP No.2 compared to the case before operation except at the wind speed of 1.0m/s.

Table Prediction of the maximum ground concentration of NO_2 by Navoi Power plant
<table>
<tr><th rowspan="2">Items</th><th rowspan="2">Atmospheric conditions (stability)</th><th rowspan="2">Wind speed</th><th rowspan="2">Before Operation of CCCGP No.2 (μg/m^3)</th><th colspan="2">After Operation of CCCGP No.2 (μg/m^3)</th><th rowspan="2">Environmental reference value of Uzbekistan (μg/m^3)</th><th rowspan="2">IFC/WB EHS General Guidelines (2007)</th></tr>
<tr><th>Stoppage of unit 3,6, 8,10</th><th>Stoppage of unit 3, 8</th></tr>
<tr><td rowspan="4">NO_2</td><td rowspan="4">B</td><td>1.0 m/s</td><td>56.4 (3.9km)</td><td>54.2 (3.6km)</td><td>58.4 (3.6km)</td><td rowspan="4">85</td><td rowspan="4">200</td></tr>
<tr><td>2.0 m/s</td><td>61.2 (2.4km)</td><td>56.0 (2.4km)</td><td>61.9 (2.4km)</td></tr>
<tr><td>3.0 m/s</td><td>62.0 (1.6km)</td><td>54.8 (1.9km)</td><td>62.0 (1.9km)</td></tr>
<tr><td>4.0 m/s</td><td>61.4 (1.4km)</td><td>52.6 (1.7km)</td><td>60.1 (1.4km)</td></tr>
</table>
・The west side of the power plant is mixture of residential area and farmland with no source of air pollution. It is expected that the current NO_2 concentration value in residential area of Navoi City is lower than 90μg/m^3, and it is also expected that the value will drop below the Uzbekistan standard of 85μg/m^3, as a result of the operation of CCCGP No.2.</td><td></td></tr>
<tr><td>(b) In the case of coal-fired power plants, is there a possibility that fugitive coal dust from coal piles, coal handling facilities, and dust from coal ash disposal sites will cause air pollution? Are adequate measures taken to prevent the air pollution?</td><td>CCCGP No.2 is not a coal-fired power plant.</td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
2 Mitigation Measures	**(2) Water Quality**		
	(a) Do effluents including thermal effluents from the power plant comply with the country's effluent standards? Is there a possibility that the effluents from the project will cause areas that do not comply with the country's ambient water quality standards or cause a significant temperature rise in the receiving waters?	**Waste water and thermal effluent discharge from Navoi power plant into Zerafshan River will be decreased in this project as the existing Unit 3 and 8 is shut down. Washing wastewater, blow-down from the cooling tower and oily effluent from CCCGP No2. will be appropriately treated by installing a new waste water treatment system. Water quality at the outlet of the treatment facility shall be monitored to confirm the compliance to the effluent standard of Uzbekistan and IFC/WB.** ＜Current status ＞ ➢ Zerefshan River ・It should be noted that water quality of Zerefshan River in Navoi, upstream of the power plant, exceeds the MPC in oil content, heavy metals, sulfate, nitrous acid, suspended solids (SS) and other items.Salinity and water temperature are increasing every year, for which the existing power plant is said to be one of the pollution source. (EIAp23,34-35) ➢ Effluent from the existing power plant ・The condenser cooling system in Unit 1~4, Unit 7~9 of the existing power station adopts once-through system. The load of pollutant is not predicted in this system, however, as described above, the high concentration of oil, sulfate and SS are observed in the effluent which reflects the water quality of Zerafshan River. ・The condenser cooling system in Unit 11 and 12 of the existing power station adopts natural-draft system, and water is usually supplied from Zerafshan River and treated with simple precipitation system before use. As a result, concentration of pollutant in the blow-down from the cooling tower exceeds the effluent standard in many items (EIA p.24). ＜Disparage＞ ➢ Thermal effluent and blow-down from the cooling tower ・As for the condenser cooling system in this project, forced-draft cooling tower system was finally adopted.This system does not generate large amount of thermal effluent as is the case of one-through system, and the shutdown of the Unit 3 and 8 will also contribute to the reduction of thermal effluent. Forced-draft cooling tower involves supply of makeup water and generation of heated cooling tower blow-down. ・The reduction of thermal effluent due to the shutdown of Unit 3 and 8 is 28,000m^3/h, and amount of blow-down from the cooling tower is 240m^3/h. Approximately 27,760 m^3/h of thermal effluent will be reduced. ・In the existing Unit 11 and 12, makeup water for cooling tower was supplied from Zerafshan River which is significantly polluted, and was used after only a simplified precipitation treatment. As a result, water quality of blow-down from the cooling tower exceeds the effluent standard in Uzbekistan. ・In order to satisfy water quality standard of Uzbekistan as well as EHS Guideline of IFC/WB even when the concentration of waste water quality is kept within 2 times of the make-up water, water treatment shall be conducted for intake water and waste water. ➢ .Washing waste water from water treatment facility ・The boiler in this project will use river water treated with the new water demineralizer. 72.5m^3/h of washing waste water is regularly generated for the maintenance of the water treatment system, whereas the washing waste water from the existing water demineralizer will be reduced as a result of shutdown of Unit 3 and 8. ・The output of the steam turbine of this project is 138MW, and that of the Unit 3 and 8 being shutdown is 300MW. As necessary amount of treated water and washing waste water are both larger in the existing Unit 3 and 8, the total effluent will be reduced by the implementation of the project. ・In this project, makeup water treatment facility and water demineralizer will be constructed to supply thermal water used for heating of the local area and steam for local factories, which regularly generates washing waste water. This waste water substitutes the waste water generation of the existing power plant and the total amount of water discharge does not increase.	

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
2 Mitigation Measures		➢ Domestic waste water ・Domestic wastewater generated by the project will be discharged into the public sewage line and not into Zerafshan River. ➢ Oily waste water ・Storm water containing oil will be generated 19m^3/h at the maximum and treated by oil-separating system before being discharged. The total effluent will be reduced due to shutdown of Unit 3 and 8. ＜Mitigation measures＞ ・Washing wastewater, blow-down from the cooling tower and oily effluent will be appropriately treated by installing a new waste water treatment system and discharged through the existing water outlet. ・Wastewater is mixed with other effluent at the outlet, and water quality at the outlet of the treatment facility shall be monitored to confirm the compliance to the effluent standard of Uzbekistan and IFC/WB.	
	(b) In the case of coal-fired power plants, do leachates from coal piles and coal ash disposal sites comply with the country's effluent standards?	**CCCGP No.2 is not a coal-fired power plant.**	N
	(c) Are adequate measures taken to prevent contamination of surface water, soil, groundwater, and seawater by the effluents?	**Waste water will be appropriately treated by introducing a treatment system or other mitigation measure and serious water pollution is not predicted.** ＜Mitigation measures ＞ ・Washing wastewater, blow-down from the cooling tower and oily effluent will be appropriately treated by installing a new waste water treatment system and discharged through the existing water outlet. ・Wastewater is mixed with other effluent at the outlet, and water quality at the outlet of the treatment facility shall be monitored to confirm the compliance to the effluent standard of Uzbekistan and IFC/WB. ・Drain system will be introduced to gather rain water and prevent oily contamination	Y
	(3) Wastes		
	(a) Are wastes, (such as waste oils, and waste chemical agents), coal ash, and by-product gypsum from flue gas desulfurization generated by the power plant operations properly treated and disposed of in accordance with the country's standards?	**Industrial waste generated from the power plant operation will be correctly collected and treated by authorized treatment business according to the Uzbekistan regulation, so no significant environmental impact is predicted.** ＜Disposal Waste in Navoi power plant＞ ・Standard for treatment of waste shall be established for all economical activities regardless of the types of industry in Republic of Uzbekistan. ・Transportation of waste for disposal site or reuse is delegated to the licensed company. Final disposal is conducted at the licensed disposal facility. ・In Navoi power plant, scrap metal and oil are reused by a special company, and sludge is disposed of at a designated disposal site. Domestic waste is disposed of at a disposal site in Navoi. ・Waste oil from the equipments and oil-separating system of the waste-water treatment system and sludge from the precipitation system of the waste-water treatment system will be generated, but may be diminished after stopping of the existing facilities. As river water, not public water, will be used for boiler feed water and make-up water for cooling tower, sludge will be generated from the water treatment system. Sludge will be treated and disposed of as in the case of the existing power plant. ＜Mitigation measures＞ ・Development of waste management program including education of workers to encourage reduction and reuse of waste. ・Prohibition of illegal dumping. ・Separation of waste by hazard level, storage in an appropriate storage site and legal disposal in an appropriate disposal site.	

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
2 Mitigation Measures	**(4) Noise and Vibration**		
	(a) Do noise and vibrations generated by the power plant operations comply with the country's ambient standards, and occupational health and safety standards?	**Mitigation measures for noise will be conducted, complying with the regulation standard of environmental noise level as well as working environment of Uzbekistan.** ➢ Noise ＜Prediction＞ ・Noise levels from CCCGP No1 and CCCGP No.2 is below 55dB at 300m from the boundary of the site, and 50 dB at 400m from the boundary, which meets daytime environmental noise standard of the Uzbekistan and IFC/WB guidelines.The nighttime noise standard, however, is not satisified. ➢ Vibration ＜Prediction＞ ・Vibration level at the residential area 200m from the project site is 40dB, a sufficiently low level. ＜Mitigation measures＞ ・Use low-noise equipment (silencer, muffler) ・Installation of soundproof cover. ・Use of low-vibration equipment. Construction of buildings with strong foundation. ・Regular maintenance of the equipment. ・Tree-planting and installation of sound proof wall around the project site. ・Complying with the noise standard of working environment and keeping the noise level 80dB or lower inside the power plant	**Y**
	(5) Subsidence		
	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	**There is no possibility that land subsidence may arise because ground water will not be used.** ・Groundwater will not be taken at the power plant.	N
	(6) Odor		
	(a) Are there any odor sources? Are adequate odor control measures taken?	**Odor source is ammonia, but CCCGP No2 will not install de-nitrification equipment, which uses ammonia.**	N
3 Natural Environment	**(1) Protected Areas**		
	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	**There is no protected area in near and around project site.** ・The project site is adjacent to the residential area and the power plant already under influence of human activity.	N
	(2) Ecosystem and biota		
	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	**Project site does not encompass primeval forests, tropical rain forests and ecologically valuable habitats.** ・The project site is adjacent to the residential area and the power plant is already under influence of human activity.	N
	(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	**Project site does not encompass habitats of endangered species.** . ・Precious species designated by IUCN (International Union for Conservation of Nature and Natural Resources) and by the Uzbekistan Red Data Book are not observed in the land around site.	N

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
3 Natural Environment	(c) If significant ecological impacts are anticipated, are adequate environmental protection measures taken to reduce the impacts on ecosystem?	**Air pollution will be mitigated by shutdown of the existing power plant.** ・The project site is adjacent to the residential area and the power plant is already under influence of human activity. - Air pollution will be mitigated by shutdown of the existing power plant.	Y
	(d) Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?	**Intake water from Zerafshan River will be decreased in this project as the existing Unit 3 and 8 is shut down. As a result, the impact on aquatic organisms will be decreased and mitigated.** - Forced draft cooling tower cooling system will intake of cooling water from the river. - Lower amount of river water will be taken compared to the old Unit 3 and 8 which used river water for cooling system.	Y
	(e) Is there a possibility that discharge of thermal effluents, intake of a large volume of cooling water or discharge of leachates will adversely affect the ecosystem of surrounding water areas?	**Intake water from Zerafshan River will be decreased in this project as the existing Unit 3 and 8 is shut down. Waste water and thermal effluent discharge from Navoi power plant into Zerafshan River will be decreased in this project as the existing Unit 3 and 8 is shut down. Waste water will be appropriately treated by installing a new waste water treatment system As a result, the impact on the ecosystem of the surrounding water areas will be decreased and mitigated.** - Either forced draft cooling tower cooling system or forced draft air cooling system will be adopted, and large amount of thermal waste water discharge is not predicted. Stopping of Unit 3 and 8 will also diminish the thermal waste water. - Forced draft cooling tower will generate cooling tower blow-down. - Plant waste water and oily waste water is generated but shutting down of the existing facilities is also decided. - Domestic waste water will be generated by project workers. - River water, not public water, will be used for boiler feed water and make-up water for cooling tower, butt may be diminished after shutting down of the existing facilities.	Y
4 Social Environment	**(1) Resettlement**		
	(a)Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	Yes. - The Project will affect 33 households located at two makhallas “Uyrot” and “Yangiobod”. These households will be entirely demolished because they are within the zone of action of the high voltage power line closer to the existing highway M-37(LARAP para18). - Thus, there are 120 DPs at this zone. All of the DPs will be needed of the compensations and another types of help. The complete list of affected households with DPs(LARAP para19). - Alternative study for project site was conducted to reduce the impact of land acquisition and resettlement.	

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td>4 Social Environment</td><td>(b) Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</td><td>Yes.
Stakeholder meetings related to resettlement
The followings are a Summary of stakeholder meetings on resettlement. Project Owner made several meetings in order to obtain consent from the residents. Finally, all resettlement households agreed with the relocation to new places.
Summary of Project Consultations (LARAP page26-28);
1st
<table>
<tr><td>Date and Time</td><td>December 20th, 2012</td></tr>
<tr><td>Language</td><td>Uzbek</td></tr>
<tr><td>Attendance</td><td>Representatives of Makhalla、Representatives of District、Managing Director of Navoi HES
31 affected households (The other 2 households did not attend this meeting. These households are about to start constructing houses, not residing at this moment.)</td></tr>
<tr><td>Agenda</td><td>Project Description、Land Acquisition and resettlement</td></tr>
<tr><td>Remarks</td><td></td></tr>
</table>
2nd
<table>
<tr><td>Date and Time</td><td>February, 2012</td></tr>
<tr><td>Language</td><td>Uzbek</td></tr>
<tr><td>Attendance</td><td>Navoi State Governor、Representatives of Makhalla、Representatives of District、Managing Director of Navoi HES
33 affected households</td></tr>
<tr><td>Agenda</td><td>Compensation to the affected households</td></tr>
<tr><td>Remarks</td><td>- Navoi State Governor explained to the affected households that 33 households were not entitled to receive compensation since they are illegal residents.
- Navoi State Governor, however, decided to provide compensation to the affected households because of the complaints from the residents.</td></tr>
</table>
3rd
<table>
<tr><td>Date and Time</td><td>May, 2012</td></tr>
<tr><td>Language</td><td>Uzbek</td></tr>
<tr><td>Attendance</td><td>Navoi State Governor、Representatives of Makhalla、Representatives of District、Managing Director of Navoi HES
33 affected households</td></tr>
<tr><td>Agenda</td><td>Compensation to the affected households</td></tr>
<tr><td>Remarks</td><td>- Resolution was issued, and only residents that are actually residing in the affected properties are entitled to receive compensation.
- Uzbekenergo hired an independent agency for evaluating replacement cost of buildings, and the cost survey started in July.</td></tr>
</table>
</td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment		4th Date and Time: August 29th, 2012 Language: Uzbek Attendance: Representatives of Makhalla、Staff of Navoi HES、JICA's study team members ・Special Commission on determining the amount of the compensation and type of compensation for the citizen (Chairman of local resettlement, Uyrot Village Citizen's Gathering, Chairman of local residential area "Yangiobod", Chairman of local residential area "Uyrot"), Deputy of Navoi HEP Agenda: Explanation of JICA project Progress of resettlement Remarks: - Real estate agency has been conducting asset inventory survey at each affected household. The survey on 12 households to be relocated in Uyrot village has already been finished, and approval signatures on the survey result have been acquired. The survey on the remaining 11 households in Yangiobod village will be completed by September 10th. - The resettlement site will be prepared at about 2km away from the power plant site. - One household receives 600m^2 of land at the resettlement site, totaling 4.4ha of land been prepared. - The procedure of the resettlement is as follows: 1) notifying the residents, 2) conducting social survey, 3) acquiring residents' approvals on asset inventory survey and the survey result, 4) calculating compensation cost, 5) paying compensation, 6) preparing land by local government, 7) constructing houses by residents, 8) relocating to the new site. - Consultation to the residents has been conducted since NO.16-68 was issued on December 27th, 2011. - Compensation will be paid based on the market price. - The alternative site located north of the existing power plant has about 400 summer houses (temporary residential houses) and about 200 permanent residential houses. **Additional Stakeholder meetings related to resettlement (the third survey.)** Additional Stakeholder Meeting was held at recreation room adjacent to Navoi CCCGP No.1 on October 30, 2012 by the project owner with helping from the survey team. This is because JICA's Guideline was not included in the explanation and it was not quite sure whether opinions from the residents were properly obtained at the public meeting on 10 January 2012. The meeting was notified of the meeting through their representative. In addition, the stakeholder meeting was publicized in the newspaper as well. The Director of Navoi thermal power station explained outline of project, objective and contents of Stake Holder Meeting to residential people who participated in the meeting. After the Director's speech, JICA Guidelines for Environmental and Social Consideration, Environmental Management Plan, Environmental Monitoring Plan and Land Acquisition and Resettlement Action Plan for this project were briefly presented. Main questions from the participants were related to resettlement plan.	

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="2">4 Social Environment</td><td></td><td>Place of meeting: Recreation Room in Navoi CCCGP No.1’s camp site
Method of notification to residential people: informing neighboring residents through their representatives and newspaper
Number of participants: 52 people
Breakdown of participants
<table><tr><td>Representatives of residents</td><td>34</td></tr><tr><td>Navoi Region, Karmana District, Hokim (Major)</td><td>1</td></tr><tr><td>Karmana District, Makhalla “Yangiobod”, Posbon (Commissary)</td><td>1</td></tr><tr><td>Karmana District, Rural Citizen Assembly “Yangiobod”, Chairman</td><td>1</td></tr><tr><td>Karmana District, Makhalla “Uirot”, Chairman</td><td>1</td></tr><tr><td>Karmana District, Makhalla “Yangiobod”, Chairman</td><td>1</td></tr><tr><td>Karmana District, Makhalla “Yangiobod”, Female Issues Consultant</td><td>1</td></tr><tr><td>Karmana District, Makhalla “Yangiobod”, Secretary</td><td>1</td></tr><tr><td>Karmana District, Chief of Land and Assets Cadaster</td><td>1</td></tr><tr><td>Karmana District, Deputy Chief of Architecture and Construction Department</td><td>1</td></tr><tr><td>Staff of Navoi TPP</td><td>9</td></tr></table>
1. Opening remarks, the project description - Director of Navoi TPP (09.20).
2. Presentation of the project – JICA’s survey team (09.40).
3. Speech by Governor of Karmana district (10.45).
4. Questions and answers. Discussion with residents to be resettled. (11.00).</td><td></td></tr>
<tr><td></td><td>(c)Is the resettlement plan, including compensation by the replacement cost, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</td><td>Yes.
However, some points are still being confirmed.
The following are referred to the LARAP.
Compensation plan: alternative land will be provided to affected households.
As for buildings, crops and transport fee will be provided as monetary compensation.

Please see the below table.(LARAP Table 12)</td><td>Y</td></tr>
</table>

Table: **Entitlement Matrix**

Loss Item 1: Residential Land			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Land compensation of 0.06 ha per each household.	1. Karmana District will receive budget from Navoi TPS for land compensation and provide the land (0.06 ha per household) to the affected households.	1. Legal owners will be assisted by UE to organize legal documents in support of their ownership. 2. The households which own more than 0.06 ha of their building area, are entitled to receive monetary compensation or land compensation for the additional land (per ha).
Loss Item 2: Housing and structures			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Replacement Value of Housing and structures	1. Replacement Value will be recommended by the independent agency. 2. Project owner will pay cash compensation under law for the land to APs. 3. If Replacement value is higher than law, the difference will be paid by project owner.	1. Legal owners will be assisted by UE to organize legal documents in support of their ownership. 2. Regarding the 10 uninhabited illegal houses, the expense for the houses will be paid by the Navoi TPS as a support activity.
Loss Item 3: Standing Trees			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Replacement Value of Standing Trees	1. Replacement Value will be recommended by the independent agency. 2. Project owner will pay cash compensation under law for the land to APs. 3. If Replacement value is higher than law, the difference will be paid by project owner.	
Livelihood Restoration			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
PAPs whose livelihood level are lowered after the relocation	1. Job training 2. Preferential hiring for works in Navoi Thermal Power Plant	1. Identifying PAPs whose livelihood levels are lowered after the relocation. 2. Uzbekenergo will provide job trainings. 3. Navoi Thermal Power Plant will hire some of them if necessary.	
Support for Vulnerable Groups			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
Households who are regarded as vulnerable	1. Support for receiving public assistance. 2. Providing assistances such as training, job-opportunities, and allowances	1. Identifying the number of PAPs who are categorized in vulnerable groups. 2. Uzbekenergo will assist the application process for the public assistance. 3. Uzbekenergo will provide assistances such as training, job-opportunities, and allowances following the established order in accordance with the regulations of Uzbekistan.	

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment	(d)Is payment of compensation made prior to resettlement?	Confirming As the schedule, payment of compensation will be made prior to resettlement.	Confirming
	(e)Is the compensation plan formulated in documents?	Yes. Please refer to the above table.	Y
	(f)Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	Yes Livelihood Allowance. – For those DPs who are vulnerable – female-headed, poor, or face significant hardship due to elderly or disabled family members – an allowance of $35 per household member for three months will be paid. (LARAP para 97)	Y
	(g)Are agreements with the affected persons obtained prior to resettlement?	Yes. (from the second and third survey)	Y

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment	(h)Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	・In accordance with Clause 41 of the Land Code, the types of compensations were decided. The Special Committee was also set up to estimate the sums of compensations (Decree No. 605-K dated July 11, 2012). ・The Special Committee may determine the types of compensations and the sums of compensations in accordance with Cabinet Decision No. 97 dated May 29, 2006 titled the "Approval of Regulations concerning Loss Compensations of Legal Entities and Citizens for Land Expropriation by the Government and for Public Purposes" and Clause 41 of the Land Code (Decree No. 605-K). ・The First Deputy of District was appointed as acting Supervision Controller of Decree No. 605-K (Decree No. 605-K). ・The Special Committee consists of two sub-committees, namely the relocation special committee to build roads and the relocation special committee to build the CCCGP2 unit. The members of the subcommittees are named below. Members of relocation special committee to build roads: ・First Deputy of District Khokim (Governor) ・Chairman of the Special Commission ・Director of Navoi AutoYul (Navoi branch of Road Agency) ・Head of the District Department of Finance ・Chief of State Unitary Enterprise District Land and Immovable Cadastre Service ・Head of the District Architecture and Construction Department ・Director of the Branch of Karmana District Gas Agency ・Head of the District Electric Power networks ・Head of the Anti-Fire Department of Interior ・Chief Doctor of the District State Sanitary Epidemiology Agency ・Head of the District Nature Protection Department ・Acting Director of the Karmana Drinking water production Liability Limited Company ・Chairman of the District Makhalla Charity Public Foundation ・Yangi Arik Village Citizen’s Gathering ・Argun Makhalla Citizen’s Gathering ・Yangi Arik Makhalla Citizen’s Gathering ・Talkok Makhalla Citizen’s Gathering ・Citizen, whose housing is being demolished for the state and public needs Relocation special committee to build the CCCGP2 unit. ・First Deputy of District Khokim (Governor) ・Chairman of the Special Commission ・Director of the Open Joint Stock Company Navoi Thermal Power Station ・Head of the District Department of Finance ・Chief of State Unitary Enterprise District Land and Immovable Cadastre Service ・Head of the District Architecture and Construction Department ・Director of the Branch of Karmana District Gas Agency ・Head of the District Electric Power networks ・Head of the Anti-Fire Department of Interior ・Chief Doctor of the District State Sanitary Epidemiology Agency ・Head of the District Nature Protection Department ・Acting Director of the Karmana Drinking water production Liability Limited Company ・Chairman of the District Makhalla Charity Public Foundation	Y

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="5">4 Social Environment</td><td></td><td>・Uyrot Village Citizen’s Gathering
・Uyrot Makhalla Citizen’s Gathering
・Yangi Obod Makhalla Citizen’s Gathering
・Citizen, whose housing is being demolished for the state and public needs
The systems are unknown to implement the relocation of local residents and provide the budget. They must be checked.</td><td></td></tr>
<tr><td>(i)Is a plan developed to monitor the impacts of resettlement?</td><td>All activities in Land Acquisition and Resettlement are time bounded. Internal monitoring (IM) will be carried out by the PIU and the Land Acquisition and Resettlement Committee in the District Hokimiyat. Process indicators will relate to implementation outputs and deliverables. These will be collected directly from the field, and will be reported monthly to the PIU to assess the LARAP implementation progress and adjust the work plan if necessary. These reports will be quarterly consolidated and submitted to JICA.(LARAP para135)</td><td>Y</td></tr>
<tr><td>(j)Is the structure of grievance mechanism established?</td><td>(LARAP para 54~59)
1) The APs will be informed in prepared brochures on all contacts and contacts persons (GFPs) responsible for the realization of the resettlement project. They will be able to call or submit personally any complaints to these persons. There should also be envisaged a possibility of a GFP’s visit directly to a place of resettlement.
2) The duration for redressing all the complaints or requests submitted by the APs is one week. If there is no reaction to the APs’ complaints within this period, APs should be able to turn to District GFP (e.g. in writing a complaint, faxing it, etc.) if necessary.
3) The District GFP will have one week from the day of submission of a complaint to provide a well-reasoned reply to APs and take an appropriate decision. The written complaint and attempts will be registered in order to be solved it. If complaint is not resolved in one week, it is passed by the GFP to the Province LARC for resolution.
4) In the event that a satisfactory answer cannot be provided, The written complaint and attempts with the AP will be registered in the Land Acquisition and Resettlement Committee (LARC) the Province Hokimiyat in order to be resolved it. If a solution is not reached within two weeks, the LARC refers it to UE PIU.
5) UE PIU will assist the activities of the GFP and LARC to resole the complaints and makes a decision within two weeks. If the District and Province are not able to resolve the dispute within the elapsed time, the UE PIU will have further two weeks to resolve the issue. If the decision is still unacceptable to the AP, the APs can take it to the District Court although all court costs (preparation and representation) will be paid for by the project – no matter the outcome.
6) The District Court will make a final decision. The decision will bind on all parties.</td><td>Y</td></tr>
<tr><td>(2) Living and Livelihood</td><td></td><td></td></tr>
<tr><td>(a)Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</td><td>Pollution control will be conducted and local residents will be preferentially employed for this project.
・The project will reduce the risk that workers and/or nearby residents face by the inhalation of hazardous substances. In addition, the level of noise and vibration caused by machinery will become lower. Compared with present conditions, the extent of impact will be improved (EIA p. 74).
・The exact number of workers to employed for the construction of CCCGP2 will not be decided until the EPC contractor is appointed. However, the construction of CCCGP2 is expected to employ a similar number of workers of CCCGP1. The table below shows the number of workers employed for CCCGP1.
<table>
<tr><th></th><th>During construction (max. number of workers)</th><th>During operation</th></tr>
<tr><td>Local residents</td><td>Up to 460 persons</td><td>54 persons</td></tr>
<tr><td>Foreigners</td><td>Up to 800 persons</td><td>More than a dozen persons</td></tr>
</table>
・This project plans to employ local residents. Vocational training of local workers will be provided, if necessary (2nd survey).</td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment		＜Mitigation measures＞ ・Pollution control such as air and noise pollution ・Priority in employment of local people, especially project-affected people. ・Provision of job training for employment	
	(b)Is sufficient infrastructure (e.g., hospitals, schools, roads) available for the project implementation? If existing infrastructure is insufficient, is a plan developed to construct new infrastructure or improve existing infrastructure?	**Social infrastructures are fully available, and access roads had already been constructed.** ・In the time of constructing CCCGP1, necessary access roads had already been constructed. (2nd survey). ・Like CCCGP1, dormitories, recreation room, sports gym, and ground for workers will be furnished (2nd survey). ・The construction site will be near Navoi City. Thus, hospitals and other social infrastructure are fully available (2nd survey).	**Y**
	(c)Is there a possibility that large vehicle traffic associated with the project will affect road traffic in the surrounding areas? Are adequate measures considered to reduce the impacts on traffic, if necessary?	**Adequate mitigation measures are provided during construction period.** ＜Current Status＞ ・Nearby national road is wide and traffic volume is not so large (2nd survey). ＜Mitigation measures＞ ・ Slowdown of vehicles in the residential and school area. ・Checking of traffic regulations, installation of traffic signs, driving safety education, speed restriction, checkup of vehicle equipment (brake, klaxon).	Y
	(d)Is there a possibility that diseases (including communicable diseases, such as HIV) will be introduced due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?	**Adequate mitigation measures are provided during construction period.** ＜Mitigation measures＞ ・Development of safety and sanitation management plan and implementation of regular medical checkup. ・The workers will have a medical examination every year ・Medical points will be set up ・The workers are required to submit the result of their medical examinations before they are employed (2nd survey).	Y
	(e)Is there a possibility that the amount of water used (e.g., surface water, groundwater) and discharge of thermal effluents by the project will adversely affect existing water uses and uses of water areas (especially fishing)?	- Forced draft cooling tower cooling system will be adopted, and intake of cooling water from the river is not necessary. - Less amount of river water will be taken compared to the old Unit 3 and 8 which used river water for cooling system.	**N**

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment	**(3) Heritage**		
	(a)Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?	**There is no historical, cultural, religious monument in the project site.** . The site is not known to have any precious archeological, historical, cultural and religious heritages and monuments (2nd local survey).	N
	(4) Landscape		
	(a)Is there a possibility that the project will adversely affect the local landscape, if there is any aesthetic landscape near the site? Are necessary measures taken?	**Serious influence on landscape is not assumed** ・The construction site is a place where people have many activities bound to power plant and houses. ・There is no particular scenery of which to give consideration (2nd local survey).	N
	(5) Ethnic Minorities and Indigenous Peoples		
	(a)Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	**The project site is not an area for minorities to live in groups.** ・The construction site is a place where people have many activities that is bound to power plant and houses. It is not a place where a minority group live together (2nd l survey).	N
	(b)Are the rights about the land and resources of an ethnic minority and indigenous people respected?	**The project site is not an area for minorities to live in groups.** ・The construction site is a place where people have many activities that is bound to power plant and houses. It is not a place where a minority group live together (2nd l survey).	N
	(6) Working conditions		
	(a)Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	**Laws and ordinances associated with the working conditions of the country will be enforced.** ・Project owner will implement the project in accordance with the labor law of the country (2nd survey). **Measures to individuals involved in the project on tangible safety considerations will be developed and conducted.** ＜Mitigation measures＞	**Y**

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
4 Social Environment	(b)Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?		Y
	(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public sanitation) for workers etc.?	**Measures to individuals involved in the project on intangible safety considerations will be planned and conducted.** ＜Mitigation measures＞ - Development of safety and sanitation management plan and implementation of regular medical checkup.	N
	(d)Are appropriate measures being taken to ensure that security guards involved in the project do not violate safety of other individuals involved, or local residents?	**Security guards will be placed from the security company** ＜Mitigation measures＞ ・Project owner will subcontract a security firm to deploy security guards. The security personnel trained by the security firm will be deployed (2nd l survey).	N

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
5 Others	**(1) Impacts during Construction**		
	(a)Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?	**Adequate mitigation measures are provided during construction period.** ➢ **Noise** ＜Mitigation measures＞ ・Periodic check up and maintenance of vehicles. ・Construction activity and traffic of vehicles is essentially limited to daytime. ・Use low-noise type equipment (silencer, muffler). ・Temporary soundproof wall around the project site. ➢ **Vibration** ＜Mitigation measures＞ ・Periodic check up and maintenance of vehicles. ・Construction activity and traffic of vehicles is essentially limited to daytime. ・Use low-vibration type equipment (silencer, muffler). ➢ **Water pollution** ＜Mitigation measures＞ ・Installation of temporary rainwater drainage. ・Installation of temporary sedimentation pond and oil-separating system ・Storage of waste oil and chemical materials in a storage site and method to prevent permeation into ground. ・Installation of septic tank and temporary toilet. ➢ **Air pollution** ＜Mitigation measures＞ ・Periodic check up and maintenance of vehicles. ・Shutdown of engine during waiting time. ・The rear deck of the sand-transport trucks shall be covered. Periodic car wash. ・Periodic watering of the site and surrounding road in case of strong wind. ➢ **Waste Solid waste** ＜Mitigation measures＞ ・Development of waste management program including education of workers to encourage reduction and reuse of waste. ・Prohibition of illegal dumping. ・Separation of waste by waste type, storage in an appropriate storage site and legal disposal in an appropriate disposal site.	N

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
5 Others	(b)If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?	**Adequate mitigation measures for Air pollution, water pollution, etc. are provided during construction period.** ➢ **Water pollution** ＜Mitigation measures＞ ・Installation of temporary rainwater drainage. ・Installation of temporary sedimentation pond and oil-separating system ・Storage of waste oil and chemical materials in a storage site and method to prevent permeation into ground. ・Installation of septic tank and temporary toilet. ➢ **Air pollution** ＜Mitigation measures＞ ・Periodic check up and maintenance of vehicles. ・Shutdown of engine during waiting time. ・The rear deck of the sand-transport trucks shall be covered. Periodic car wash. ・Periodic watering of the site and surrounding road in case of strong wind.	Y
	(c)If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	**Adequate mitigation measures are provided during construction period.** ➢ Employment ＜Mitigation measures＞ ・Priority in employment of local people, especially project-affected people. ・Provision of job training for employment ➢ Local community ・Access roads had already been constructed. ・In near Navoi City, hospitals and other social infrastructure are fully available. ＜Mitigation measures＞ ・.Provide dormitories, recreation room, medical points during construction - Development of safety and sanitation management plan and implementation of regular medical checkup. -The workers will have a medical examination -Slowdown of vehicles in the residential and school area. - Traffic of construction vehicles during school commuting hours shall be avoided. - Checking of traffic regulations, installation of traffic signs, driving safety education, speed restriction, checkup of vehicle equipment (brake, klaxon).	Y
	(2)Accident Prevention Measures		
	(a)In the case of coal-fired power plants, are adequate measures planned to prevent spontaneous combustion at the coal piles? (e.g., sprinkler systems).	**CCCGP No.2 is not a coal-fired power plant.**	N

<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td rowspan="3">5 Others</td><td>(3)Monitoring</td><td></td><td></td></tr>
<tr><td>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</td><td>Monitoring during construction and operation phase will be conducted in order to assure the environmental impacts caused by the project.
・Monitoring plan about potential impacts during construction and operation phase was prepared.</td><td>Y</td></tr>
<tr><td>(b) How are the item of a monitoring plan, a method, frequency, etc. defined?</td><td>・Environmental Monitoring Plan (Item, Method, Frequency etc) are as below.
Items, location, method, frequency, responsibility and expense of the environmental monitoring plan
<table>
<tr><th>Classification</th><th>Item</th><th>Parameter</th><th>Method</th><th>Location</th><th>Frequency</th><th>Responsibility</th><th>Expense</th></tr>
<tr><td rowspan="4">Construction phase</td><td>Air quality</td><td>NOx (NO, NO_2), Suspended particles (Dust)</td><td>Automatic mobile ambient air quality analyzers</td><td>2 point: west and south Residential area in the vicinity</td><td>- Quarterly
- Once a week at the time</td><td>- Implementation: EPC Contractor/ Environmental Consultant
- Supervisor: PIU/Navoi Thermal power plant/Supervision Consultant</td><td>Expense is included in EPC contract cost by EPC Contractor.</td></tr>
<tr><td>Noise</td><td>Noise level</td><td>Sound-level meter</td><td>2 point: project site west and south boundary
2 point: west and south residential area in the vicinity</td><td>- Quarterly
- Once a week at the time</td><td>- Implementation: EPC Contractor/ Environmental Consultant
- Supervisor: PIU/ Navoi Thermal power plant/Supervision Consultant</td><td>Expense is included in EPC contract cost by EPC Contractor.</td></tr>
<tr><td>River water quality</td><td>TSS, pH, Oil</td><td>- Analysis by sampling</td><td>2 point: in Zerafshan River, 100m upstream and 100m downstream of the outlet of waste water from temporary sedimentation pond.</td><td>- Quarterly</td><td>- Implementation: EPC Contractor/ Environmental Consultant
- Supervisor: PIU/ Navoi Thermal power plant/Supervision Consultant</td><td>Expense is included in EPC contract cost by EPC Contractor.</td></tr>
<tr><td>Waste</td><td>Waste management practice in storage and disposal</td><td>- Contract and record</td><td>- Project site and camp and service facility for worker.</td><td>-Continuously</td><td>- Implementation: EPC Contractor
-Supervisor: PIU/ Navoi Thermal power plant/Supervision Consultant</td><td>Expense is included in EPC contract cost by EPC Contractor.</td></tr>
<tr><td></td><td>Grievances</td><td>Numbers, contents, and processing results of grievances</td><td>Record</td><td>Navoi Thermal Power Plant</td><td>-Continuously</td><td>Navoi Thermal Power Plant / Karamana Khokimiyat</td><td>Navoi Thermal Power Plant/PIU</td></tr>
</table></td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)							Yes: Y No: N
		Operation phase	Exhaust gas	NOx,	Continuous. Emission Monitoring System(CEMS)	Gas duct	-Continuously	Navoi Thermal Power Plant	CEMS: Expense is included in EPC contract cost by EPC Contractor.	
			Waste water	Temperature, pH, SS., Oil, DO, Nitrite, Nitrate, Sulfate, Chloride, Ca,Mg. Residual chlorine, Cr, Cu, Fe, Zn, Pb, Cd, Hg	- Analysis by sampling	Outlet of waste treatment facility	-Quarterly	Navoi Thermal Power Plant	Navoi Thermal power plant	
			Air quality	NOx (NO, $NO_{2.}$)	- Automatic ambient air quality analyzer and recorder	1 point: west residential are 2km from site	-Quarterly - Once a week at the time	Navoi Thermal power plant or Environmental Consultant	Equipment 80,000$ （Consultant） 50,000$/year	
			River Water quality	Temperature, pH, DO, BOD, SS, Oil, Ammonia, Nitrite, Nitrate, Sulfate, Phenol, Chloride, Ca, Na, K, Phosphate, Fe, Cu, Zn, Cr, Pb	- Analysis by sampling	2 point: in Zerafshan River, 100m upstream and 100m downstream of the existing outlet of wastewater. (the current monitoring points)	- Quarterly	Navoi Thermal power plant	Navoi Thermal power plant	
			Noise	Noise level	Sound-level meter	2 point: project site west and south boundary 2 point: west and south Residential area in the vicinity	Twice a year	Navoi Thermal power plant or Environmental Consultant	Navoi Thermal power plant	
			Waste	Waste oil, sludge, domestic waste	Record	Storage sites	Twice a year	Navoi Thermal Power Plant	Navoi Thermal Power Plant	

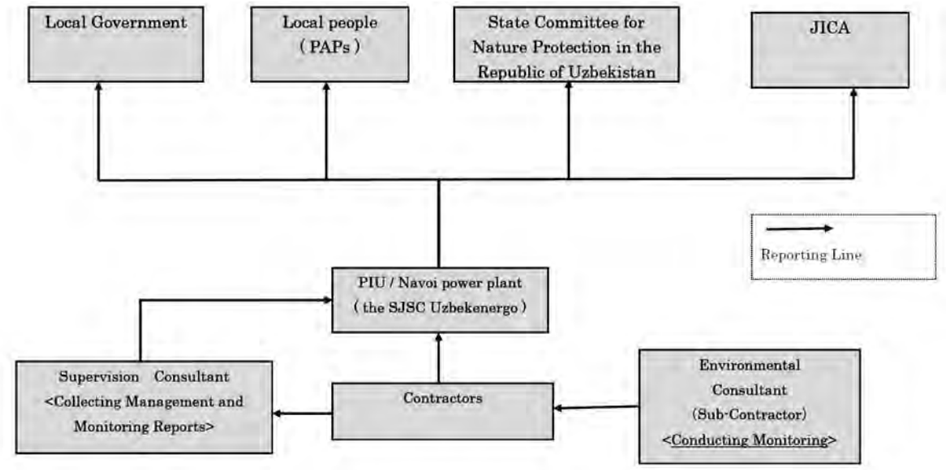
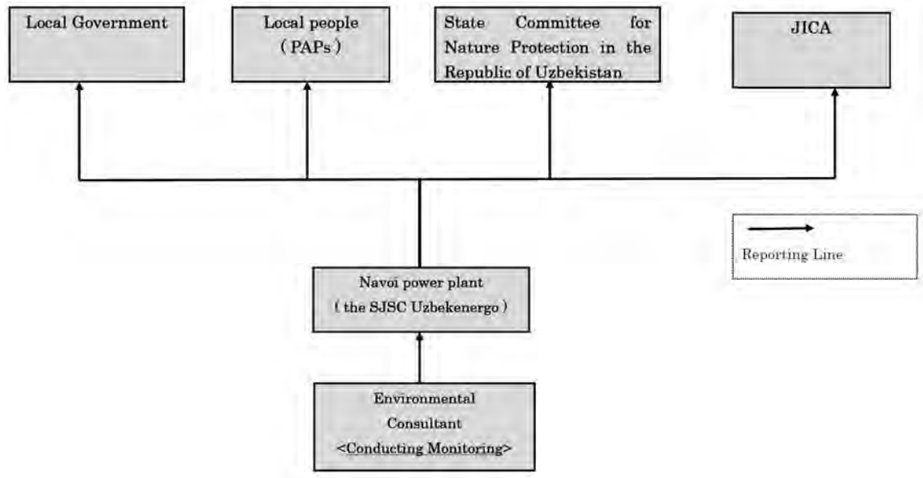
<table>
<tr><th colspan="2">Main Check Items</th><th>Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)</th><th>Yes: Y
No: N</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td>Grievances</td><td>The numbers, contents, and processing results of grievances</td><td>Record</td><td>Navoi Thermal Power Plant</td><td>Everyday</td><td>Navoi Thermal Power Plant / Karamana Khokimiyat</td><td>Navoi Thermal Power Plant</td></tr>
</table>
</td><td></td></tr>
<tr><td></td><td>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</td><td>Monitoring framework including organization and equipment will be established, and adequate budget will be secured.
・Same as the existing power plant, monitoring framework including organization and equipment will be established, and adequate budget will be secured.
・Organization structure for environmental monitoring implementation during construction and operation phase will be described as below.
 

Figure: Environmental Management and Monitoring Implementation Structure in Construction Phase</td><td>Y</td></tr>
</table>

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
		 Figure: Environmental Management and Monitoring Implementation Structure in Operation Phase	

Main Check Items		Confirmation of Environmental Considerations (Reason, Justify, Counter Measures, etc.)	Yes: Y No: N
	(d)Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	**Regular reporting to the regulatory authorities will be conducted.** ・The environmental management administrator shall regularly conduct explanation to the local people and a report to the State Committee for Nature Protection, JICA and other relevant organizations about the environmental monitoring with frequency of twice a year during construction phase and once a year during operation phase.	Y
6 Note	**Reference to Checklist of Other Sectors**		
	(a)Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of electric transmission lines and/or electric distribution facilities).	・The existing power plants have already constructed most of the transmission lines. Thus, constructing new transmission lines for this project will be small in scale.	Y
	(b)Where necessary, pertinent items described in the Ports and Harbors checklist should also be checked (e.g., projects including construction of port and harbor facilities).	・This project will build no harbors.	N
	Note on Using Environmental Checklist		
	(a)If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, and global warming).	・Adoption of high-efficiency combined cycle power generation system and maintenance of capacity of the facility. ・The reduction of CO2 emission concerning this project compared with an average power generation facility in Uzbekistan is more than 684,150 tons per year.	N

8.10.2 Monitoring Form

Items that require monitoring shall be decided on according to the sector and nature of the project, with reference to the following list of items.

1.Construction phase

1) Air pollution
Location: 2points (west and south residential area in the vicinity)
Regulation: Sanitary norms, rules and hygiene normative documents of the Republic of Uzbekistan. San PinNo.0015-94

Location:

(Parameter: NO_2 Unit μg/m^3)

Date	Measured Value		Uzbekistan maximum permissible concentration (MAC)		IFC/ EHC Guideline General;2007
	30min Min－Max	24hr Average Min－Max	30min	24hr	1hr
			85	60	200
				-	-
				-	-
				-	-
				-	-

Location:

(Parameter: Suspended particles,Unit μg/m^3)

Date	Measured Value		Uzbekistan maximum permissible concentration (MAC)		IFC/ EHC Guideline (General; 2007)
	30min Min－Max	24hr Average Min－Max	30min	24hr	24hr
			150	100	150
				-	-
				-	-
				-	-
				-	-

2) Noise
Location: 4 points (2 points :project site west and south boundary 2 points:west and south residential area in the vicinity)
Regulation: Protection from noise" (State committee of Uzbekistan for architecture and construction. Tashkent. 1996) (Norms for household construction)（KMK 2001.08-96）

Date;

(Unit: dBA)

Location	Min－Max	Uzbekistan Noise standards	IFC/ EHC Guideline (General; 2007) residential area	Remarks
Site west boundary		Residential area day: 55 night: 45	Residential area day: 55 night: 45	
Site south boundary				
Site west residential area				
Site south residential area				

3) Water pollution

・River water quality

Location: 2 points (100m upstream and 100m downstream of the outlet of waste water from temporary sedimentation pond in Zerafshan River)

Regulation: Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

Location:

Sampling Date:

Item	Unit		Environmental standard in Uzbekistan	Remarks
pH	—		6.5- 8.5	
DO	mg/ℓ		Summer: 4.0 or higher Winter: 6.0 or higher	
BOD	mgO2/ℓ		3.0	
SS	mg/ℓ		30	
Oil	mg/ℓ		0.05	
Ammonia	mg/ℓ		0.08	
Nitrite	mg/ℓ		0.08	
Nitrate	mg/ℓ		40	
Sulfate	mg/ℓ		100	
Phenol	mg/ℓ		0.001	
Chloride	mg/ℓ		300	
Calcium	mg/ℓ		180	
Sodium	mg/ℓ		120	
Potassium	mg/ℓ		50	
Phosphate	mg/ℓ		0.01	
Fe	mg/ℓ		0.5	
Cu	mg/ℓ		0.001	
Zn	mg/ℓ		0.01	
Cr	mg/ℓ		0.5	
Pb	mg/ℓ		0.03	

4) Waste

Location: site and camp and service facility for worker.

Regulation: RD 118,0027714.60-97

Nature protection.Treatment of waste from production and consumption.Terms and definitions. Goskompriroda of Uzbekistan. Tashkent. 1997.

Date;

(Unit: t or kg)

Item	Hazardou Class	Place of generated waste	Storage amount	Disposal amount	Disposal method and place

5) Grievance

Date	Name	Contents	Status	Results	Remarks

2 Operation phase

1) Air pollution

- **Emission concentration**

Location: Gas duct
Regulation: GOST 29328-92
Date:

Parameter	Unit	Min –Max	Excess period of the standard	GOST 29328-92	IFC/ WB EHC Guideline (Thermal Power Plant; 2008) <Gas fuel>	Remarks
NO_X	mg/Nm^3			51	51	Gas

Note dry gas base,O_2=15%

- **Ambient air quality**

Location:1point (west residential are at 2km from site)
Regulation:Sanitary norms, rules and hygiene normative documents of the Republic of Uzbekistan. San Pin No. 0015-94
Date:

(Parameter: NO_2 Unit $\mu g/m^3$)

Month	Measured Value			Uzbekistan maximum permissible concentration (MAC)		IFC/WB EHC Guideline General;2007	
	30min Min－Max	24hr Average Min－Max	All Average	30min	24hr	1hr	1year
				85	60	200	40

2) Noise

Location: 4 point (2 points :project site west and south boundary 2points:west and south residential area in the vicinity)
Regulation: Protection from noise" (State committee of Uzbekistan for architecture and construction. Tashkent. 1996) (Norms for household construction)（KMK 2001.08-96）
Date;

(Unit: dBA)

Location	Min－Max	Uzbekistan Noise standards	IFC/ EHC Guideline (General; 2007) residential area	Remarks
Site west boundary		Residential area day: 55 night: 45	Residential area day: 55 night: 45	
Site south boundary				
Site west residential area				
Site south residential area				

3) Water pollution

a. Waste water

Location: Outlet of waste treatment facility

Regulation: Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

Sampling Date:

Parameter	Unit		Uzbekistan Standard for Navoi Power plant	IFC/ WB EHC Guideline (Thermal Power Plant; 2008)	Remarks
Temperature	—		—	—	
pH	—		6.5－8.5	6.5－9.0	
SS	mg/ℓ		487	50	
Oil	mg/ℓ		0.112	10	
Dissolved inorganic	mg/ℓ		1,500	－	
Nitrite	mg/ℓ		3.3	－	
Nitrate	mg/ℓ		45	－	
Sulfate	mg/ℓ		500	－	
Chloride	mg/ℓ		350	－	
Calcium	mg/ℓ		487	－	
Magnesium	mg/ℓ		170.1	－	
Residual chlorine	mg/ℓ		－	0.2	
Total chromium	mg/ℓ		－	0.5	
Copper	mg/ℓ		－	0.5	
Iron	mg/ℓ		4.62	1.0	
Zinc	mg/ℓ		－	1.0	
Lead	mg/ℓ		－	0.5	
Cadmium	mg/ℓ		－	0.1	
Mercury	mg/ℓ		－	0.005	
Arsenic	mg/ℓ		－	0.5	

b .River water quality

Location: 2 points (100m upstream and 100m downstream of the existing outlet of wastewater in Zerafshan River)

Regulation: Rules for protection of surface water from contamination by discharge water.（San Pin No.0056-98）

Location:

Sampling Date:

Item	Unit		Environmental standard in Uzbekistan	Remarks
pH	—		6.5- 8.5	
DO	mg/ℓ		Summer: 4.0 or higher Winter: 6.0 or higher	
BOD	mgO2/ℓ		3.0	
SS	mg/ℓ		30	
Oil	mg/ℓ		0.05	

Ammonia	mg/ℓ		0.08	
Nitrite	mg/ℓ		0.08	
Nitrate	mg/ℓ		40	
Sulfate	mg/ℓ		100	
Phenol	mg/ℓ		0.001	
Chloride	mg/ℓ		300	
Calcium	mg/ℓ		180	
Sodium	mg/ℓ		120	
Potassium	mg/ℓ		50	
Phosphate	mg/ℓ		0.01	
Fe	mg/ℓ		0.5	
Cu	mg/ℓ		0.001	
Zn	mg/ℓ		0.01	
Cr	mg/ℓ		0.5	
Pb	mg/ℓ		0.03	

4) Waste

Location: Stroage sites

Date:

Item	Storage Amount	Disposal Amount	Remarks
Sludge			
Waste oil			

5) Grievance

Date	Name	Contents	Status	Results	Remarks

Appendix 8-1 LARAP

UZBEKENERGO LAND ACQUISITION AND RESETTLEMENT ACTION PLAN (LARAP)

for the Navoi Thermal Power Station Modernization Project

January, 2013

TABLE OF CONTENTS

ABBREVIATIONS

AB	Affected Business
ANSI	American National Standard Institute
APs	Affected Persons
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
C/P	Counterpart
CCCGP	Combined Cycle Cogeneration Plant
CCPP	Combined Cycle Power Plant
CDM	Clean Development Mechanism
CSS	Country Safeguard System
Df/R	Draft Final Report
DI	Design Institute
DP	Displaced Person
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EMA	External Monitoring Agency
ES	Engineering Stage
EPC	Engineering, Procurement and Construction Contract
FIRR	Financial Internal Rate of Return
F/R	Final Report
F/S	Feasibility Study
GFP	Grievance Focal Point
GRC	Grievance Redress Committee
GT	Gas Turbine
GTW	Gas Turbine World
HH	Household
HHV	Higher Heating Value
HP	High Pressure
HRSG	Heat Recovery Steam Generator
I&C	Instrumentation and Control
Ic/R	Inception Report
IA	Implementing Agency
IMA	Internal Monitoring Agency
IFC	International Finance Corporation
IP	Illegal Persons
IPP	Independent Power Producer
ISO	International Standard Organization
JICA	Japan International Cooperation Agency
JSC	Joint Stock Company
LAR	Land Acquisition and Resettlement

LARAP	Land Acquisition and Resettlement Action Plan
LARC	Land Acquisition and Resettlement Committee
LC	Land Code
LHV	Lower Heating Value
LP	Low Pressure
MW	Mega Watt
NG	Natural Gas
NGO	Non-Governmental Organization
NHC	National Holding Company
NOx	Nitrogen Oxide
O&M	Operation and Maintenance
ODA	Official Development Assistance
OEM	Original Equipment Manufacturer
PIU	Project Implementation Unit
PSA	Poverty and Socio-Economic Assessment
PSS/E	Power System Simulator for Engineering
RP	Resettlement Plan
ROW	Right Of Way
SPS	Safeguard Policy Statement
SJSC	State Joint Stock Company
SOx	Sulfur Oxide
ST	Steam Tribune
SUELICS	State Unitary Enterprise Land and Immovable Cadastre Service
TA	Technical Assistance
TEPSCO	Tokyo Electric Power Services Co., LTD.
TPP	Thermal Power Plant
TPS	Thermal Power Station
UE	State Joint Stock Company “Uzbekenergo”
USD	United States Dollar
Uzbekistan	Republic of Uzbekistan
VAT	Value Added Tax
W/S	Work Shop
WB	World Bank

GLOSSARY OF TERMS

Affected Persons	Term used to describe all people that are affected by the project impacts. In the context of LARAP it refers to those that are economically or physically displaced by the project.
Compensation	Term means payment in cash or kind for an asset to be acquired or affected by a project at replacement cost at current market value.
Cut-off-date	Term means the date after which people will NOT be considered eligible for compensation, i.e. they are not included in the list of APs as defined by the census. Normally, the cut-off date is the date of the detailed measurement survey.
Displaced Persons	Sometimes referred to as Affected Persons (APs).In the context of involuntary resettlement, displaced persons are those who are physically displaced (relocation, loss of residential land, or loss of shelter) and/or economically displaced (loss of land, assets, access to assets, income sources, or means of livelihoods) as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.
Economic Displacement	Loss of land, assets, access to assets, income sources, or means of livelihoods as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.
Encroachers	Term means those people who move into the project area after the cut-off date and are therefore not eligible for compensation or other rehabilitation measures provided by the project.
Entitlement	Term means the range of measures comprising cash or kind compensation, relocation cost, income rehabilitation assistance, transfer assistance, income substitution, and relocation which are due to /business restoration which are due to APs, depending on the type and degree nature of their losses, to restore their social and economic base.
Hokim	An Executive Head in the Republic of Uzbekistan (the same as governor or mayor). There are province, district and city/town hokims. Hokim is a head of local authority organization – Hokimiyat.
Inventory of losses	Term means the pre-appraisal inventory of assets as a preliminary record of affected or lost assets.
Land acquisition	Term means the process whereby a person is compelled by a public agency to alienate all or part of the land s/he owns or possesses, to the ownership and possession of that agency, for public purposes, in return for fair compensation.
Makhalla	A traditional neighboring community. At present the term means an administrative and territorial unit in the Republic of Uzbekistan. The unit has local public authorities – makhalla committee.
Meaningful Consultation	A process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v)enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.
Non-titled	Term means those who have no recognizable rights or claims to the land that they are occupying and includes people using private or state land without permission, permit or grant i.e. those people without legal title to land and/or

	structures occupied or used by them. JICA's policy explicitly states that such people cannot be denied compensation.
Poor	Official government statistics for share of people living under poverty line[1] is not available. The method used to determine poverty, was based on the World Bank's under $2.15 per person per day measure (see: http://www.undp.uz/en/mdgs/?goal=1).This figure was calculated with respect to climate conditions and other set of factors. The local equivalent was calculated based on the official exchange rate.
Physical Displacement	Relocation, loss of residential land, or loss of shelter as a result of (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas.
Replacement cost	Term means the method of valuing assets to replace the loss at current market value, or its nearest equivalent, and is the amount of cash or kind needed to replace an asset in its existing condition, without deduction of transaction costs or for any material salvaged.
TEPSCO	Study Team of Preparatory Survey on Navoi Thermal Power Station Modernization Project.
Vulnerable	Term means any people who might suffer disproportionately or face the risk of being marginalized from the effects of resettlement and includes; (i) female-headed households with dependents; (ii) disabled household heads; (iii) poor households (within the meaning given previously); (iv) landless; (v) elderly households with no means of support; (vi) households without security of tenure; (vii) ethnic minorities; and (viii) marginal farmers (with landholdings of five acres or less).

CURRENCY EQUIVALENTS

(as of 15 September, 2012)
Currency Unit – Uzbekistan Sum (UZS)
UZS 1.00 = $0.00052
$1.00 = UZS 1,930.25

NOTE

In this report,

– "$" refers to United States dollars (USD)

– "UZS" refers to Uzbekistan Sum (UZS)

[1]There is no term "poverty line" in the official usage of Uzbek Government. The terms "be in straitened circumstances" and "lower-income families" are using in the legal documents. The social aid is paying for "lower-income families" if the average total monthly income per family member is less than 1.5 minimum monthly wage fixed by Government. At the moment the minimum monthly wage is equal 79,590 UZS (40.3 USD). So, an average monthly income per family member must be less than 119,385 UZS (60.4 USD) for receipt of the social aid.

I. EXECUTIVE SUMMARY

This Land Acquisition and Resettlement Action Plan has been prepared based on the information as of January 2013. If there are gaps between this LARAP and the Minutes of Discussions of Appraisal which has done subsequently, the Minutes of Discussion of Appraisal should prevail.

1. This Land Acquisition and Resettlement Action Plan (LARAP) has been developed by Center for Social and Marketing Research "Expert-Fikri". It follows the format and includes the required information as specified in JICA's Guidelines for Environmental and Social Considerations[2] and The World Bank's Operational Policy (OP 4.12 – Involuntary Resettlement). It is based on survey carried out in October 2012.

2. The data provided by this LARAP is not completed, so final alignment during detailed design will require a new review and additional information on the part of State Joint Stock Company "Uzbekenergo". To ensure that impact and other data is updated based on the final design and guarantee that the DPs are fully compensated or rehabilitated before their land is taken, the following basic project implementation conditions related with this LARAP have been established:

   - Contract awards for civil work construction will be approved only after LARAP has been reviewed and confirmed the final detailed design.

3. The main objective of this LARAP is to provide an effective guideline to the State Joint Stock Company "Uzbekenergo" (UE) and the Project Implementation Unit (PIU) to implement land acquisition and compensation along JICA's Guideline and the World Bank OP's principles; the requirements of the prevailing legal norms of Uzbekistan; and, in compliance with the JICA's Guidelines. The Table 1 shows the summary of LAR cost.

[2]See: www.jica.go.jp/english/our_work/social_environmental/guideline/pdf/guideline100326.pdf

Table 1. LAR Cost Summary		
	'000 UZS	**$US**
Compensation for land		
Land Preparation Costs*	20,000	10,361
Compensation		
Housing and Structures	1,233,656	641,501
Trees	7,831	4,072
Support and Assistance		
Structures for illegal	39,400	20,488
Other Costs		
Resettlement Consultant under PIU**	to be estimated later	to be estimated later
Sub-Total	**1,300,887**	**676,422**
Contingency (10%)	130,089	67,642
TOTAL	**1,430,976**	**744,064**

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*"Land Preparation Costs" may be increased because 20 mil sum is cost of independent company who estimate cost of land and houses only. Other land preparation cost such as land registration cost is not estimated yet.

** Resettlement consultant is to be estimated later because TOR of Resettlement consultant is not determined yet.

I.1. Project Scope

4. The Project comprises the construction of a new Unit of combined-cycle plant at Navoi Thermal Power Station. The new Unit (450MW) is going to be adjacent to another combined-cycle plant, which has been constructed in 2012, on the side of the local highway M-37 (see the Map 1). Construction of this Unit involves relocation of a high voltage (220kV) power lines, - as shown in Map 1.

5. This project intends to decommission units No. 3 and 8 (310 MW in total) of the existing Navoi Thermal Power Plant (1,250 MW) near the Navoi City, Uzbekistan by 2015 and to construct CCCGP No. 2 featuring high efficient cogeneration plant with a power generation capacity of 450 MW on the site adjacent to this plant. It is considered that CCCGP No. 2 may have different systems from CCCGP No. 1, since this plant contains facilities for supplying a large quantity (200 Gcal/hr. at the maximum) of heat (in the form of steam and hot water).For example, the heat recovery steam generator (HRSG) is equipped with a duct firing system and the firing capacity may be much greater than CCCGP No. 1 to produce far more amount of heat energy (please see Map 1).

I.2. Summary of Impacts

6. Tables 2 and 3 show a summary of the key of assets that will be acquired. 33 households will be affected due to the project. 23 inhabited households will be provided the alternative land and monetary compensation.

7. Although, 10 uninhabited houses are determined to be illegal at the court, the expense for the uncompleted houses will be paid by the Navoi TPS as a support activity.

Table 2. Summary of Impacts

No.	Type of impact	Quantity
1	Private structure completed – inhabited	23
	Vulnerable households	(11)
2	Uncompleted houses (without roof or walls) - uninhabited	10
Total households		**33**

Table 3. Summary of Affected Structures								
Households		**Land (Ha)**			**Structures Lost**		**Displaced Persons**	
No.	*Household'sNumber (ID)*	*Total*	*Lost*	*%*	*No.*	*m^2*	*M*	*F*
"Uyrot" makhalla								
1	Household No. 1	0.07	0.07	100%	1	405.0	2	1
2	Household No. 2	0.33	0.33	100%	1	1,460.3	4	1
3	Household No. 3	0.06	0.06	100%	1	258.3	1	4
4	Household No. 4	0.13	0.13	100%	1	524.2	2	2
5	Household No. 5	0.03	0.03	100%	1	385.4	3	1
6	Household No. 6	0.28	0.28	100%	1	323.2	1	1
7	Household No. 7	0.08	0.08	100%	1	158.4	2	3
8	Household No. 8	0.18	0.18	100%	1	310.9	1	4
9	Household No. 9	0.07	0.07	100%	1	167.8	1	4
10	Household No. 10	0.06	0.06	100%	1	227.2	1	1
11	Household No. 11	0.17	0.17	100%	1	177.1	2	2
12	Household No. 12	0.24	0.24	100%	1	348.1	3	3
"Yangiobod" makhalla								
13	Household No. 13	0.02	0.02	100%	1	275.0	2	4
14	Household No. 14	0.14	0.14	100%	1	158.9	2	2
15	Household No. 15	0.01	0.01	100%	1	47.5	1	2
16	Household No. 16	0.02	0.02	100%	1	168.6	3	1
17	Household No. 17	0.06	0.06	100%	1	108.2	2	1
18	Household No. 18	0.07	0.07	100%	1	219.5	2	2
19	Household No. 19	0.05	0.05	100%	1	173.0	1	2
20	Household No. 20	0.07	0.07	100%	1	215.2	3	2
21	Household No. 21	0.05	0.05	100%	1	160.7	2	2
22	Household No. 22	0.06	0.06	100%	1	192.1	2	2
23	Household No. 23*	0.08	0.08	100%	2	293.5	1	2
24	Household No. 24**	0.06	0.06	100%	2	54	1	7
25	Household No. 25**	0.08	0.08	100%	1	180	3	1
26	Household No. 26**	0.08	0.08	100%	1	192	2	3
27	Household No. 27**	0.08	0.08	100%	2	178	1	4
28	Household No. 28**	0.12	0.12	100%	1	200	3	3
29	Household No. 29**	0.08	0.08	100%	1	108	1	1
30	Household No. 30**	0.08	0.08	100%	1	76	2	2
31	Household No. 31**	0.08	0.08	100%	2	92	1	3
32	Household No. 32**	0.06	0.06	100%	1	45	2	2
33	Household No. 33**	0.06	0.06	100%	2	103	1	3
Total		**3.11**	**3.11**	**100%**	**38**	**7,986**	**61**	**78**

* This household was included in the "legal" list after Decree of Hokim on 17 October 2012 was issued.

** These are uninhabited households that didn't get registration in District Cadastre.

Map 1. Location of the Areas of Resettlement within the Project Zone

II. PROJECT DESCRIPTION

8. This section provides a general description of the project, its components and the alternatives considered to avoid or minimize resettlement.

II.1. General Description

9. According to Resolution by President of the Republic of Uzbekistan dated 19.08.2009 No. PP-1196 the construction of combined-cycle at Navoi Thermal Power Station was approved and included in the Investment Program of Uzbekistan for 2009-2012.

10. The proposed investment program targets the construction of combined-cycle plant at Navoi Thermal Power Station (TPS) project is financed through JICA. The Executing Agency for the Project is the State Joint Stock Company “Uzbekenergo”.

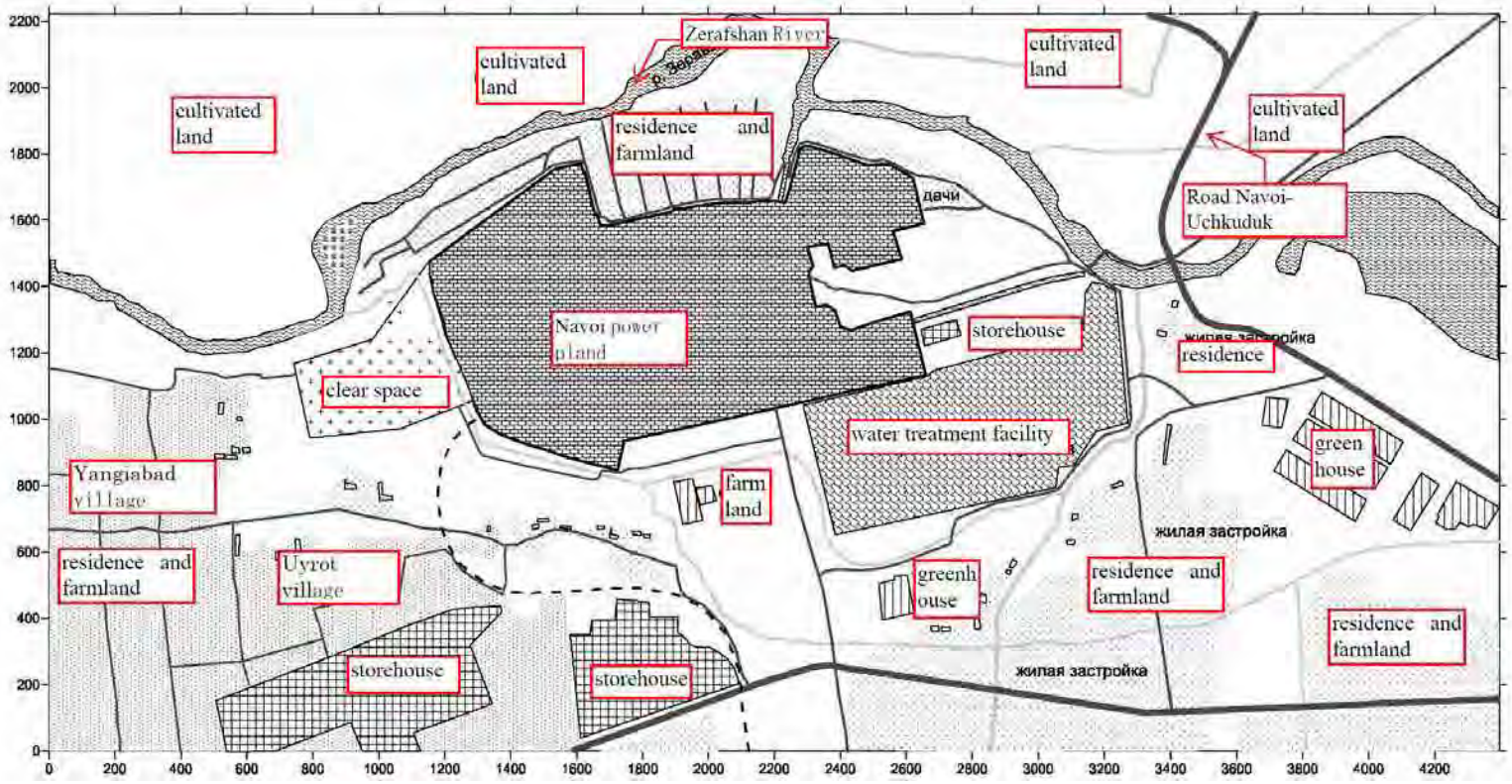
II.2. Project Area

11. This Project intends to decommission units No. 3 and 8 (310 MW in total) of the existing Navoi Thermal Power Plant (1,250 MW) near the Navoi City, Uzbekistan by 2015 and to construct CCCGP No. 2 featuring high efficient cogeneration plant with a power generation capacity of 450 MW on the site adjacent to this plant.

12. Uzbekistan is characterized by typical continental climate consisting of a very hot summer, comparatively cold winter, a great temperature difference between daytime and night time, and dry weather with little precipitation. The planned project site is adjacent to the existing Navoi thermal power plant located in the suburbs of Navoi of Uzbekistan approximately 360 km west-southwestern (WSW) of Tashkent, capital of Uzbekistan. The CCCGP No.2 (450MW) power plant is considered to require a site area of approximately 9.0 ha.

13. The existing Navoi power plant site is located 6km northwest of Navoi City, at altitude of 334.2m, with the area of approximately 100ha. The land facing the north side of the site is farmland and residential area, and the south side is the residential area of Uyrot Village and the road connecting Tashkent and Bukhar. In the east side, the residential area of Michurin Village, Zerafshan River, and the road connecting Navoi and Uchkuduk are located. The west side is the mixture of residential area and farmland of Yangiobod Village; the residential area is located up to about 2.5km from the power plant, and only farmland exists beyond that point. The near residential area from the existing power plant site is located 650m west and 400m south west of the site (Map 2).

Map 2: Land use around Navoi thermal power plant



II.3. Alternatives Considered

14. Consideration of the zero option: In the case where CCCGP No.2 is not constructed and the existing old-type power plants (Unit 3 and Unit 8) continue operation, the air quality around the plant area will remain in a bad condition, the reliability of the facility will decrease, and the risk of accident will increase.

15. Consideration of the alternative project site: In the EIA, the north end of the existing power plant site is considered as an alternative site for constructing CCCGP No.2 (Figure 1).However, further consideration of this plan was called off by the reasons described in the table 4 below. The current proposed site facing the west of CCCGP No.1, even though resettlement of 33 households is predicted, is considered the most favorable alternative.

Table 4: Comparison of the alternative site

Item	The north end of the existing power plant site（Site A）	The site facing west of CCCGP No1 (proposed site) （Site B）
Techniques	-Construction of gas supply facility is necessary within the operating plant site and the construction activity involves high risk.	New site and low risk for construction of gas supply facility.
Topology	-Not enough space for construction activity. -Not enough space for constructing a storage facility.	-Enough space for construction activity. -Enough space for constructing a storage facility.
Resettlement	-Destruction and resettlement of the existing 200 living houses and 400 summer houses within the site is predicted.	-There is no house within the site and no resettlement is predicted. -There are 23 houses and basis of 10 houses within ROW of Transmission line.

16. Consideration of the ROW of transmission line: In order to reduce the number of resettlement, the ROW of transmission line was considered.

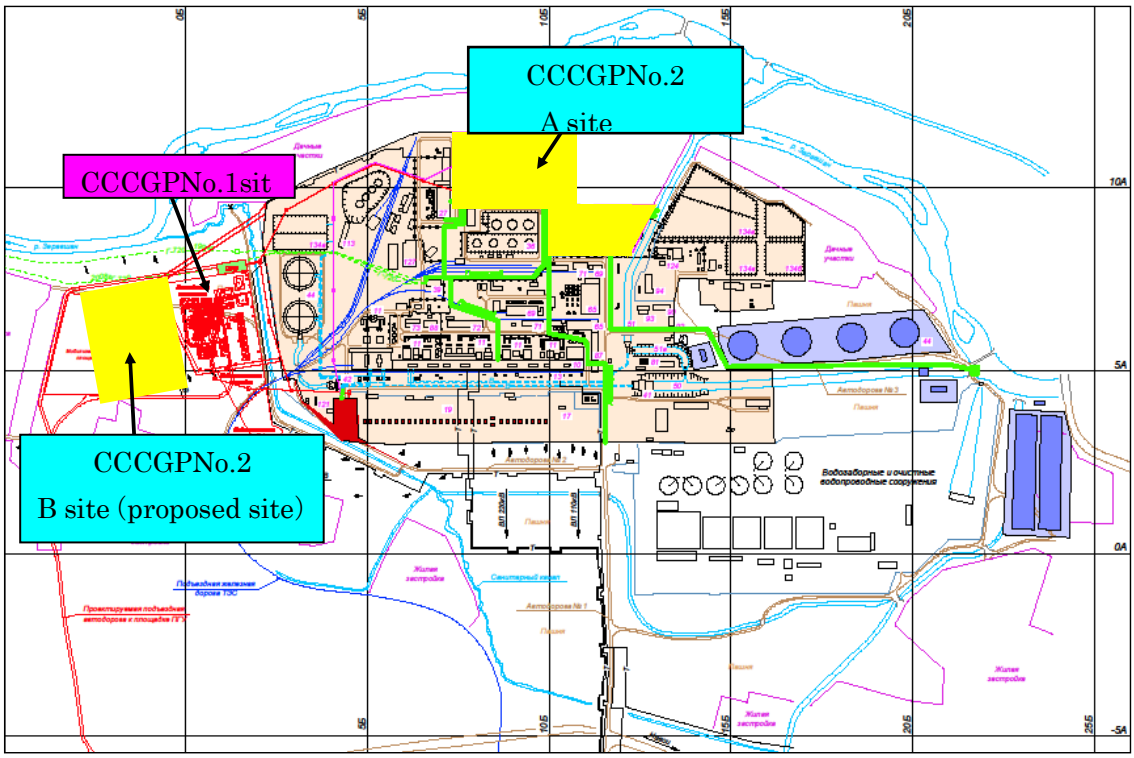


Figure 1: Location of Alternative project site A and B

17. The DI has designed the proposed Units with relocation of high voltage power line within the constraints of several criteria.

18. **Key Infrastructure Objects** – The proposed General Plan tries to lay the high voltage power line closer to the existing highway M-37 and another small rural road (not marked in Map 1), and to avoid all significant telecom, water, gas, electricity and cell-phone infrastructure where possible.

19. **Existing Businesses and Households** – Where possible, businesses, households, agricultural fields and temporary structures have been avoided in the designs provided by the DI. This follows existing Uzbekistan Law that requires the minimization of all impacts. Nevertheless, the high voltage power line exposure area is going to cover a number of residential households and agricultural plots of land which will need to be relocated for the realization of the Project. These will be the subject of this Land and Resettlement Action Plan (LARAP).

III. SCOPE OF LAND ACQUISITION AND RESETTLEMENT

20. This section discusses the project potential impacts, the scope of land acquisition and summarizes the key effects in terms of acquired assets and displaced persons.

III.1. Project Impacts

21. The Project is going to significantly affect two makhallas located in close proximity to the designed second Unit of Navoi TPS – "Uyrot" (12 HHs) and "Yangiobod" (11 HHs). All the residential buildings and household outbuildings in these makhallas are to be alienated and demolished since they fall into the area of the high voltage power line relocation (see Annex 2).

22. A resolution was issued by Karmana District Hokim № 605-К of 11th July, 2012 (see Annex 4) on forming a special commission to estimate the size of compensation to citizens whose households fall into the resettlement zone.

23. Besides, there are 10 households located at makhalla "Yangiobod" that were refused by local authorities to register as the legal owners of assets on the using land plots. The main official cause for this decision is that these owners didn't live on the land plots. According to the rule of the State Cadastre the persons who didn't complete the construction on their land plots and didn't live there can be refused in the registration. Anyway, this is the official cause to refuse them in registration.[3]

III.2. Scope of Land Acquisition and Resettlement

24. The Project will affect to 33 households located at two makhallas "Uyrot" and "Yangiobod" (see Annex 8). These households will be entirely demolished because they are into the zone of action of the high voltage power line closer to the existing highway M-37.

25. Thus, there are 139 DPs at this zone. All of the DPs will be needed of the compensations and another types of help. The complete list of affected households with DPs you can see in the Table 3 above.

[3]There are the legal causes to refuse in registration. In the "Directions on the procedure for official registration of the rights to land plots in the Republic of Uzbekistan" registered by Ministry of Justice of the Republic of Uzbekistan (No. 736 May 27, 1999) it is the following: "4.3. The rights to land plots are registered on the basis of the following documents: - when there emerges the right of ownership of the land plot - on the basis of the official warrant to the right of ownership, purchase-and-sale contracts and other documents specified under the law; - when there emerges the right of possession and use of the land plot - on the basis of a decision to allocate a land plot taken by an appropriate authority (an official)…". The "illegal households" have no any required by law documents.

IV. SOCIOECONOMIC INFORMATION AND PROFILE

IV.1. Economic and Social Development in Navoi Province and Karmana District

26. Navoi Province is located in the central part of Uzbekistan. The area of the province constitutes 110.8thousand square kilometers or 24.8% of total area of the country. Population is 886 thousand. The volume of GDP of Navoi Province was 3,681 billion UZS ($1.907 billion), GDP per capita – $2,152.[4]

27. The structure of Navoi Province GDP is formed from industry (45% GDP), construction (25% GDP) and agriculture (22% GDP). The biggest enterprises of Navoi Province are Navoi mining-and-metallurgical Integrated works, "Navoiazot", "Electrokhimzavod", "Kyzylkum-cement", Navoi TPS, etc.[5]

28. Karmana District is located in the south of Navoi Province. The area of the district constitutes 0.95 thousand square kilometers or less than1% of total area of the province. Population is 105.6 thousand (12% of total population of the province, ethnic Uzbeks – 91%).

29. The main specialization of Karmana District is the agriculture (cotton, wheat). There are some enterprises on the territory of Karmana District, including one of the biggest –Navoi TPS.[6]

IV.2. Poverty and Socioeconomic Assessment

30. This Project is going to affect the territory adjacent to Navoi TPS, with 33 households falling into the resettlement zone. According to the TEPSCO survey, the households are going to be relocated within the same settlement, at a distance of, approximately, 2-3 kilometers from their current location.

31. The relocation place was selected because the place is near the current residential area, main road, public facilities such as schools, basic infrastructures like electricity and gas line has been installed close to the site. Affected households agree with the relocation places.

IV.3. Project Census

32. The project census was undertaken over period 10th to 18th September, 2012. The census data were added during the second and third visits in the affected area in November 1st to 4th and December 1st to 3rd. It comprised the household questionnaire made by TEPSCO and Expert-Fikri. Most of the respondents were willing to answer the questions and tell about their concerns as to their possible resettlement. There were no problems with gathering information in makhalla "Uyrot" because all the households in this makhalla are residential; however, there were some difficulties in gathering information in makhalla "Yangiobod" where most of the buildings are not residential but yet incomplete, hence not listed in the State Cadastre.

33. In addition, the resettlement survey by the district and the survey by an independent evaluation consultant/agency that "Uzbekenergo" hires which was been conducted for land resettlement by this project.

[4] The State Committee of the Republic of Uzbekistan on statistics: http://www.stat.uz/en/reports/214/
[5] The official site of Navoi Province Hokimiyat: http://www.navoi.uz/ru/aboutnavoi/potential/general_info/
[6] The official site of Navoi Province Hokimiyat: http://www.navoi.uz/ru/abouthokim/cityhokimiyats/

Household Structure

Table 5. Household Composition by Gender and Age								
№	Household No.	Gender		Number of household's member:				
		Male	*Female*	*working*	*college student*	*pensioner, housewife*	*school and preschool children younger 18 years old*	*unemployed older 18 years old*
Makhalla "Uyrot"								
1	Household No. 1	2	1	1	1	1		
2	Household No. 2	4	1	2			3	
3	Household No. 3	1	4	2			3	
4	Household No. 4	2	2				2	2
5	Household No. 5	3	1			1	2	1
6	Household No. 6	1	1			2		
7	Household No. 7	2	3	1		1	3	
8	Household No. 8	1	4	2			3	
9	Household No. 9	1	4	1		1	3	
10	Household No. 10	1	1			2		
11	Household No. 11	2	2	1		1	2	
12	Household No. 12	3	3	2		1	3	
Makhalla "Yangiobod"								
13	Household No. 13	2	4	1		1	4	
14	Household No. 14	2	2	1			2	1
15	Household No. 15	1	2	1			2	
16	Household No. 16	3	1	1		1	2	
17	Household No. 17	2	1	1		1	1	
18	Household No. 18	2	2	1		1	2	
19	Household No. 19	1	2	1		1	1	
20	Household No. 20	3	2	1		1	3	
21	Household No. 21	2	2	1		1	2	
22	Household No. 22	2	2	1		1	1	1
23	Household No. 23 *	1	2	1		1	1	
"Illegal persons" from makhalla "Yangiobod"								
24	Household No. 24	1	7	2			4	2
25	Household No. 25	3	1	1		1	2	
26	Household No. 26	2	3	1		3	1	
27	Household No. 27	1	4	1		2	1	1
28	Household No. 28	3	3	1		1	2	2
29	Household No. 29	1	1	1			1	
30	Household No. 30	2	2			1	2	1
31	Household No. 31	1	3				2	2
32	Household No. 32	2	2	1			2	1
33	Household No. 33	2	2			1		3

* This household was included in the "legal" list after Decree of Hokim on 17 October 2012 was issued.

Education

34. The census showed that of all the adult household members aged 18+ (75 persons including "illegal households"), 61% had secondary education, 21% – college or technical school, 11% – higher or incomplete higher and 7% – less than 9 grades. All the children of school age attend secondary school. 88% of the households have children attending secondary schools or preschool facilities.

Employment

35. Of all the adult household members (18years old and over – 75 persons), 52% work somewhere, 23% are housewives, 11% are pensioners, and 12% are permanently or temporary unemployed. 23% of 39 all employed members work at the Navoi TPS, 26% of them work at 'Navoiazot' enterprise, 5% (2 persons) – outside Uzbekistan, 5% (2 persons) – self-employed, and 41% (17 persons) work at other enterprises (state and private).

36. 80% of all the employed household members' positions do not require specialized formal education (driver, watchman, worker, guard), and 20% – require such education (inspector, operator, foreman, engineer).

Household Income and Expenditures[7]

37. The average monthly income per households is 535,000 UZS ($277); that is 4,400 UZS ($2.28) per household member a day. This amount is somewhat higher than $2.15 (4,150 UZS) – the poverty level established by the World Bank and other international organizations in Uzbekistan as a required minimum per person a day for purchasing basic food items.

Table 6.Household Income from the Different Sources

Source of income	Per household		Per person		% of 22 HH
	1,000 UZS	*USD*	*1,000 UZS*	*USD*	
Wages or salary	377	195	92	48	70.4
Pensions received from government	62	32	15	8	11.6
Money earned from vegetables and fruits from own or lease land	22	12	5	3	4.2
Money earned from animal breeding and selling	17	9	4	2	3.1
Money earned from small trade or small business	14	7	3	2	2.5
Loan	9	5	2	1	1.7
Scholarships received by students	7	3	2	1	1.2
Other	28	15	7	4	5.3
TOTAL	535	277	131	68	100.0

[7] The data were collected only for 22 households that really live in the replacement area.

Table 7. Household Average Expenditures by Different Items					
Item	Per household		Per person		% of 22HH
	1,000 UZS	*USD*	*1,000 UZS*	*USD*	
Food	5,675	2,940	63	33	60.8
Clothes	955	494	11	5	10.2
Education	860	446	10	5	9.2
Health care/medicines	498	258	6	3	5.3
Utilities	487	252	5	3	5.2
Fuel	227	118	3	1	2.4
Recreation	205	106	2	1	2.2
Taxes	117	61	1	1	1.3
Other	312	162	3	2	3.3
TOTAL	9,336	4,836	104	54	100.0

38. The main share of average household expenses is for food (60.8%) and clothes (10.2%) (Table 7). 50% of the households (# 2, 3, 5, 9, 13, 14, 15, 17, 18, 19 and 20) are living below the poverty line, and will need certain allowances to be paid to them since they fall under the category of vulnerable groups.

39. One of the households is comprised of three different families (# 2, 4 and 6 in Table 5). A 75-year old pensioner, household NO.6 has the highest income and actually supports his eldest son's family in which neither the son himself nor his wife work. Besides, one of household No.4's sons is disabled.

IV.4. Gender and Ethnic Minority Issues

40. A single woman with two small children (aged 9 and 10) lives in household #15. She is disabled (is lame in one leg), however, she still works because disability pension is somewhat less than the salary she is being paid at the Navoi TPS. That is why she does not apply for a pension (the Law does not allow to work and get disability pension at the same time).

41. Apart from this case, the census did not reveal any gender or ethnic minority problems.

IV.5. The "Illegal Persons" (IP)

42. In this paragraph it will be described the situation with the 10 households in makhalla "Yangiobod". Karmana District Cadastre refused to register the 10 households. The uninhabited houses are determined to be illegal at the court, but the expense for the completed houses will be paid by the Navoi TPS as a support activity.

IV.6. Inventory of Loss (IOL)

43. The loss for land, buildings and trees is shown in Table 8-10.

Table 8. Land Required for the Project				
No	**Household No.**	**Land (ha)**		
		Total	**Acquired**	**%**
Makhalla "Uyrot"				
1	Household No. 1	0.07	0.07	100%
2	Household No. 2	0.33	0.33	100%
3	Household No. 3	0.06	0.06	100%
4	Household No. 4	0.13	0.13	100%
5	Household No. 5	0.03	0.03	100%
6	Household No. 6	0.28	0.28	100%
7	Household No. 7	0.08	0.08	100%
8	Household No. 8	0.18	0.18	100%
9	Household No. 9	0.07	0.07	100%
10	Household No. 10	0.06	0.06	100%
11	Household No. 11	0.17	0.17	100%
12	Household No. 12	0.24	0.24	100%
	Total for makhalla "Uyrot"	**1.70**	**1.70**	**100%**
Makhalla "Yangiobod"				
13	Household No. 13	0.02	0.02	100%
14	Household No. 14	0.14	0.14	100%
15	Household No. 15	0.01	0.01	100%
16	Household No. 16	0.02	0.02	100%
17	Household No. 17	0.06	0.06	100%
18	Household No. 18	0.07	0.07	100%
19	Household No. 19	0.05	0.05	100%
20	Household No. 20	0.07	0.07	100%
21	Household No. 21	0.05	0.05	100%
22	Household No. 22	0.06	0.06	100%
23	Household No. 23	0.08	0.08	100%
	Total for makhalla "Yangiobod"	**0.63**	**0.63**	**100%**
	Total for both makhallas	**2.33**	**233**	**100%**
"Illegal persons" from makhalla "Yangiobod"				
24	Household No. 24	0.06	0.06	100%
25	Household No. 25	0.08	0.08	100%
26	Household No. 26	0.08	0.08	100%
27	Household No. 27	0.08	0.08	100%
28	Household No. 28	0.12	0.12	100%
29	Household No. 29	0.08	0.08	100%
30	Household No. 30	0.08	0.08	100%
31	Household No. 31	0.08	0.08	100%
32	Household No. 32	0.06	0.06	100%
33	Household No. 33	0.06	0.06	100%
	Total for "Illegal persons"	**0.78**	**0.78**	**100%**

Table 9. Loss of Structures			
No	**Household Number**	**Type of structure**	**Affected area (m^2)**
Makhalla "Uyrot"			
1	Household No. 1	Housing and household outbuildings	405.0
2	Household No. 2	Housing and household outbuildings	1,460.3
3	Household No. 3	Housing and household outbuildings	258.3
4	Household No. 4	Housing and household outbuildings	524.2
5	Household No. 5	Housing and household outbuildings	385.4
6	Household No. 6	Housing and household outbuildings	323.2
7	Household No. 7	Housing and household outbuildings	158.4
8	Household No. 8	Housing and household outbuildings	310.9
9	Household No. 9	Housing and household outbuildings	167.8
10	Household No. 10	Housing and household outbuildings	227.2
11	Household No. 11	Housing and household outbuildings	177.1
12	Household No. 12	Housing and household outbuildings	348.1
	Total for makhalla "Uyrot"		**4,745.9**
Makhalla "Yangiobod"			
13	Household No. 13	Housing and household outbuildings	275.0
14	Household No. 14	Housing and household outbuildings	158.9
15	Household No. 15	Housing and household outbuildings	47.5
16	Household No. 16	Housing and household outbuildings	168.6
17	Household No. 17	Housing and household outbuildings	108.2
18	Household No. 18	Housing and household outbuildings	219.5
19	Household No. 19	Housing and household outbuildings	173.0
20	Household No. 20	Housing and household outbuildings	215.2
21	Household No. 21	Housing and household outbuildings	160.7
22	Household No. 22	Housing and household outbuildings	192.1
23	Household No. 23	Housing and household outbuildings	293.5
	Total for makhalla "Yangiobod"		**2,012.2**
"Illegal persons" from makhalla "Yangiobod"			
24	Household No. 24	basis	54
25	Household No. 25	basis	180
26	Household No. 26	basis	192
27	Household No. 27	basis	178
28	Household No. 28	basis	200
29	Household No. 29	basis	108
30	Household No. 30	basis	76
31	Household No. 31	basis	92
32	Household No. 32	basis	45
33	Household No. 33	basis	103
	Total for "Illegal persons"		**1,228.0**

Table 10 Loss of Trees			
No	**Household Number**	**Type of structure**	**Affected trees**
Makhalla "Uyrot"			
1	Household No. 1	Trees	35
2	Household No. 2	Trees	6
3	Household No. 3	Trees	33
4	Household No. 4	Trees	39
5	Household No. 5	Trees	2
6	Household No. 6	Trees	98
7	Household No. 7	Trees	23
8	Household No. 8	Trees	161
9	Household No. 9	Trees	21
10	Household No. 10	Trees	77
11	Household No. 11	Trees	28
12	Household No. 12	Trees	129
	Total for makhalla "Uyrot"		652
Makhalla "Yangiobod"			
13	Household No. 13	Trees	78
14	Household No. 14	Trees	13
15	Household No. 15	Trees	
16	Household No. 16	Trees	
17	Household No. 17	Trees	
18	Household No. 18	Trees	
19	Household No. 19	Trees	23
20	Household No. 20	Trees	
21	Household No. 21	Trees	
22	Household No. 22	Trees	
23	Household No. 23	Trees	
	Total for makhalla "Yangiobod"		114

V. INFORMATION DISCLOSURE, CONSULTATION, AND PARTICIPATION

44. This section outlines the consultation and participation processes that have already been undertaken to prepare the LARAP and those that are required during its update and implementation.

V.1. Project Stakeholders

45. The project consists of a number of stakeholders, all of whom will have some involvement in the RP process and mitigation of impacts. These were identified early in the RP process and targeted through a series of consultations. They include:

- Displaced Persons.
- Local officials from Karmana District Hokimiyat and include cadastral, road, environment, medical, economic and rural committee members.
- Land and resettlement Committee Members (LARC).
- Representative of Citizen's Gathering from "Yangi Aryk" Village, "Uyrot" Makhalla and "Yangiobod" Makhalla.

V.2. Summary of Project Consultations

- **Public consultation**

46. Summary of Project Consultations are shown the below.

Table 11: Summary of Project Consultations

1st

Date and Time	December 20th, 2012
Language	Uzbek
Attendance	Representatives of Makhalla Representatives of District Managing Director of Navoi HES 31 affected households (The other 2 households did not attend this meeting. These households are about to start constructing houses, not residing at this moment.)
Agenda	Project Description Land Acquisition and resettlement
Remarks	

2nd

Date and Time	February, 2012
Language	Uzbek
Attendance	Navoi State Governor Representatives of Makhalla Representatives of District Managing Director of Navoi HES 33 affected households
Agenda	Compensation to the affected households
Remarks	- Navoi State Governor explained to the affected households that 33 households were not entitled to receive compensation since they are illegal residents. - Navoi State Governor, however, decided to provide compensation to the affected households because of the complaints from the residents.

3rd

Date and Time	May, 2012
Language	Uzbek
Attendance	Navoi State Governor Representatives of Makhalla

	Representatives of District Managing Director of Navoi HES 33 affected households
Agenda	Compensation to the affected households
Remarks	- Resolution was issued, and only residents that are actually residing in the affected properties are entitled to receive compensation. - Uzbekenergo hired an independent agency for evaluating replacement cost of buildings, and the cost survey started in July.

4th

Date and Time	August 29th, 2012
Language	Uzbek
Attendance	Representatives of Makhalla Staff of Navoi HES TEPSCO members Special Commission on determining the amount of the compensation and type of compensation for the citizen Chairman of local resettlement, Uyrot Village Citizen's Gathering, Chariman of local residential area "Yangiobod", Chairman of local residential area "Uyrot", Deputy of Navoi HEP
Agenda	Explanation of JICA project Progress of resettlement
Remarks	- Real estate agency has been conducting asset inventory survey at each affected household. The survey on 12 households to be relocated in Uyrot village has already been finished, and approval signatures on the survey result have been acquired. The survey on the remaining 11 households in Yangiobod village will be completed by September 10th. - The resettlement site will be prepared at about 2km away from the power plant site. - One household receives 600m2 of land at the resettlement site, totaling 4.4ha of land been prepared. - The procedure of the resettlement is as follows: 1) notifying the residents, 2) conducting social survey, 3) acquiring residents' approvals on asset inventory survey and the survey result, 4) calculating compensation cost, 5) paying compensation, 6) preparing land by local government, 7) constructing houses by residents, 8) relocating to the new site. - Consultation to the residents has been conducted since NO.16-68 was issued on December 27th, 2011. - Compensation will be paid based on the market price. - The alternative site located at north of the existing power plant has about 400 of summer houses (temporary residential houses) and about 200 of permanent residential houses.

5th

Date and Time	October 30th, 2012
Language	Uzbek
Attendance	Resettled residents Navoi TPS Director Navoi TPS Deputy Director Navoi TPS Assistant Director Navoi TPS Chairman of a union Navoi TPS of PIU Navoi TPS Chief of information Navoi TPS Secretary Navoi region, Karmana District, Hokim Karmana District, Makhalla "Yangiobod", Posbon Karmana District, Rural Citizen Assembly "Yangiobod", Chairman Karmana District, Makhalla "Uirot", Chairman Karmana District, Makhalla "Yangiobod", Chairman Karmana District, Makhalla "Yangiobod", Female Issues Consultant Karmana District, Makhalla "Yangiobod", Secretary Karmana District, Chief of Land and Assets Cadaster Karmana District, Deputy Chief of Architecture and Construction Department Residents and representatives of JICA and TEPSCO

Agenda	Opening remarks, project description Presentation of the project Speech by Governor of Karmana district Questions and Answers, Discussion with residents to be resettled
Remarks	- Residents have no objection to the new project. - Governor Ismatov proposed the residents to begin construction on new allocated sites today at their own expense. Compensation money will be paid in spring, so that they could start construction the main building. - According to the law, monetary compensation cannot be made by cash.

•Stake holder meeting.

47. The main goals of these consultations are: (a) to identify DPs' concerns and needs related to the development and implementation of the RP; (b) to define DPs' preferences as to the type and form of compensation to be provided to them; (c) to minimize DPs' concerns and assure them of transparency of all the actions related to the RP; (d) to help avoid unnecessary delays in the progress and implementation of the Project.

48. This Project triggered the discussion among the general public and stakeholders. In particular, there were conducted several meetings during the second visit of TEPSCO to Navoi (27-31 October 2012) both with households falling under the RP and with different official representatives of local authorities (Karmana District Hokim, Makhalla committee chairman, etc.).

49. During the meetings with DPs (presentation of the draft version of the LARAP, 30 October 2012), JICA's guideline, compensation policy and entitlement, grievance redress mechanism and resettlement schedule were explained. Participants did not voice any doubts that representatives of local authorities were trying to make people say something that was not actually true. All the participated in this meeting DPs know that their households will be relocated as a result of the Project implementation and expansion of Navoi TPS (the list of the participants in this meeting see in the Annex3). Ten households who were considered as illegal households did not attend this meeting.

50. Representatives of local authorities (Karmana District hokim and chairman of makhalla committee who is also in charge of "Uyrot" and "Yangiobod" makhallas to be resettled) showed their willingness to do their best so that the DPs did not suffer any damage as a result of the resettlement.

51. At the same time, after the meeting the TEPSCO Team was met by the few people who complained that Navoi Province Hokim refused them in compensation for their destroyed assets as the result of the expansion of Navoi TPS.

52. As it turned out these people have the land plots at Makhalla "Yangiobod" but don't have the legal papers for ones. Some years ago these people have purchased the land plots from the certain local farmer who doesn't live now in Karmana District. The permission for this deal was received from previous Karmana Hokim but it was the illegal deal because a land cannot be a subject of purchase and sale according to Uzbek Law (Land Code, Articles 16, 17). So, the new Karmana Hokim said that he cannot offend against law.

53. Of course, such answer could not satisfy the "illegal persons" as we name of these people from Makhalla "Yangiobod". They are complaining for the current situation and requiring satisfy their requirements about the providing of the new land plots.

54. The list of the "illegal persons" (10 persons – households' heads) as the following:

Household No.24 – land plot 0.06 ha and 2 non-built houses (only foundation),

Household No.25 – land plot 0.08 ha and 2 non-built houses (1 – only foundation and 1 – without roof),

Household No.26 – land plot 0.08 ha and 4 non-built rooms (only walls),

Household No.27 – land plot 0.08 ha and 4 built living rooms and toilet room (but they didn't live there),

Household No.28 – land plot 0.12 ha and 4 non-built living rooms (only foundation),

Household No.29 – land plot 0.08 ha and 3 non-built rooms (only walls),

Household No.30 – land plot 0.08 ha and non-built house (only walls),

Household No.31 – land plot 0.08 ha and non-built house (without roof),

Household No.32 – land plot 0.06 ha and non-built house (only foundation),

Household No.33 – land plot 0.06 ha and non-built house (only foundation)

V.3. Further Information Disclosure

55. Further information disclosure will occur once approval of the RP has been obtained by the UE and JICA.

56. The full RP (translated into Uzbek) will be distributed to each makhalla for display and reference by all APs. An index sheets outlining each DP, maps of the new land plots, assets and entitlements will also be on available for review. All DPs have been informed of this, and understand that they will be able to provide comments or grievances through the normal channels.

57. Details of the updated implementation timeline, procedures and activities; entitlement matrix; and, grievance procedures will be provided at that time to each DP. The updated LARAP (in English) will be disclosed, and prior to any resettlement activities.

VI. GRIEVANCE REDRESS MECHANISM

58. This section describes mechanisms to receive and facilitate the resolution of affected persons' concerns and grievances.

VI.1. General Principles

59. JICA's Guideline requires that a grievance redress mechanism is established and maintained. It should be designed to efficiently receive and facilitate the resolution of affected peoples' concerns and grievances about project levels social and environmental issues. The grievance redress mechanism should be scaled to the risks and impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people.

VI.2. Grievance Coordination

60. The contact details:
Mr. Sh.Ismatov (Governor of Karama District)
Address: Karamana District, SSG Yangi-Ariq, MSG Talqoq

Mr. G. Mamatov (Chairman of Makhalla Yangiobod)
Address: Uyrot ishogi QFY Makhalla Yangiobod
Tel: +998 79 436-603-71-83

Mr. N.Ergashev (Chairman of Makhalla Uyrot)
Address: Karamana District Uyrot QFY, Makhalla Uyrot,

61. GFP is an organization handling all the complaints from the local inhabitants, and is established within Makhalla which is an organization of the inhabitants, and within districts which is an administrative organization.

62. The GFP will be assisted and supported by members of the District Land and Resettlement Committee (LARC) who will maintain a register of complaints, keep track of their status and report to the PIU's Head. They will regularly track complaints received, actions taken and the status of resolution. Complaint forms will be distributed to the heads of local makhalla's and the District GFP to facilitate recording of complaints.

VI.3. Grievance Procedures

63. The APs should be informed in prepared brochures on all contacts and contacts persons (GFP) responsible for the realization of the resettlement project. They will be able to call or submit personally any complaints to these persons. There should also be envisaged a possibility of a GFP's visit directly to a place of resettlement.

64. The duration for redressing all the complaints or requests submitted by the APs is one week. If there is no reaction to the APs' complaints within this period, APs should be able to turn to District GFP (e.g. in writing a complaint, faxing it, etc.) if necessary.

65. The District GFP will have one week from the day of submission of a complaint to provide a well-reasoned reply to APs and take an appropriate decision. The written complaint and attempts will be registered to be solved it. If complaint is not resolved in one week, it is passed by the GFP to the District LARC for resolution.

66. In the event that a satisfactory answer cannot be provided, the written complaint and attempts with the AP will be registered in the Land Acquisition and Resettlement Committee (LARC) the District Hokimiya to be resolved it. If a solution is not reached within two weeks, the LARC refers it to UE PIU.

67. UE PIU will assist the activities of the GFP and LARC to resolve the complaints and makes a decision within two weeks. If the District is not able to resolve the dispute within the elapsed time, the UE PIU will have further two weeks to resolve the issue. If the decision is still unacceptable to the AP, the APs can take it to the District Court although all court costs (preparation and representation) will be paid for by the project – no matter the outcome.

68. The District Court will make a final decision. The decision will bind on all parties. Table 12 shows the summary of grievance procedure.

Table 12. Summary of Grievance Procedure

Step	Stage in Response Handling	Required Activities
1	Makhalla Head or Makhalla GFP	Verbally responds to questions and/or complaints. If no response within one week, or response is unsatisfactory, AP prepares a grievance in writing (utilize standard forms where possible).
2	District GFP	Registers the written complaint and attempts to solve it. If complaint is not resolved in one week, it is passed by the GFP to the District LARC for resolution.
3	District Land Acquisition and Resettlement Committee (LARC)	Registers the written complaint and attempts to resolve it with the AP within two weeks. If a solution is not reached, the LARC refers it to UE PIU.
4	Uzbekenergo PIU	Assists in the activities of the GFP and LARC in the resolution of complaints. Makes a decision within two weeks. In the event that the District is not able to resolve the dispute within the elapsed time, the UE PIU will have further two weeks to resolve the issue. If the decision is still unacceptable to the AP, they make take it before the District Court, with all costs paid for by the project.
5	District Court of Law	The District Court hears the case and makes a final decision that is binding on all parties.

VII. LEGAL FRAMEWORK

69. This section describes National and Local Laws and the gaps with JICA Policy.

VII.1. Relevant Provisions for Involuntary Resettlement in Uzbekistan

70. There are no laws or legislation in Uzbekistan that specifically address matters related to involuntary resettlement. Rather land acquisition is governed by the following laws and resolutions:

- **The Civil Code. –** This Code is enacted by Oliy Majlis of Uzbekistan No. 257-I of August 29, 1996. Amended according to different laws of Uzbekistan of 1996-2012.
- **The Land Code. –** This Code is approved by the Statute of Uzbekistan No. 598-I of April 30, 1998. Amended according to Division XIX of the Statute of Uzbekistan of August 30, 2003, item 41 of the Statute of Uzbekistan of December 3, 2004.
- **The State Land Cadastre. –** This Law is approved by the Statute of Uzbekistan No. 666-I of August 28, 1998. Amended according to different laws of Uzbekistan of 2002-2004.
- **The State Cadastre. –** This Law is approved by the Statute of Uzbekistan No. 171-II of December 15, 2000. Amended according to different laws of Uzbekistan of 2002-2011.
- **Cabinet of Ministers Resolution on "Order of realization into private property of objects of trade and public services together with land plots where they are located, and land plots into life inheritance tenure". –** This Resolution No. 126 is adopted of April 11, 1995. Amended according to Resolution of CM No. 202 of April 30, 1999.
- **Cabinet of Ministers Resolution on "Order of compensation of citizens' and legal entities' losses due to land plots acquisition for state and public needs". –** This Resolution No. 97 is adopted of May 29, 2006. Amended according to Resolutions of CM No. 248 of November 9, 2010 and No. 146 of May 25, 2011.
- **Annex to Cabinet of Ministers Resolution No. 97. –** This Annex includes all prime rules and regulation that assign the order of compensation.

71. Collectively, these regulations provide a sound basis for acquiring land for public purposes and for compensating land users according to the registered use of the land.

VII.2. JICA's Policy on Involuntary Resettlement (IR)

72. JICA's main principle of involuntary resettlement is finding a way to avoid it if possible by analyzing all actual alternatives. The meetings with local authority's representatives and the analysis of the developed Project for construction of two new Units of Navoi TPS showed that there are no alternatives to involuntary resettlement within the frames of this Project.

73. That is why, all the APs should receive proper compensation and support so that they could improve, or at least restore, their customary way of life and earn incomes at the level existing prior to the realization of the Project. Compensation should be based on the cost of replacement in the maximum fullest extent. Compensation and other types of assistance should be provided prior to resettlement.

74. When developing the LARAP, JICA's policy towards IR is also being agreed with the World Bank Strategy specified in the OP (Operating Policy) 4.12 Involuntary Resettlement (December, 2001).

75. The Government of Uzbekistan will use the Project Resettlement Policy (the Project Policy) for the Navoi Thermal Power Station Modernization Project specifically because existing national laws and regulations have not been designed to address involuntary resettlement according to international practice, including JICA's policy. The Project Policy is aimed at filling-in any gaps in what local laws and regulations cannot provide in order to help ensure that PAPs are able to rehabilitate themselves to at least their pre-project condition. This section discusses the principles of the Project Policy and the entitlements of the PAPs based on the type and degree of their losses. Where there are gaps between

the Uzbekistan legal framework for resettlement and JICA's Policy on Involuntary Resettlement, practicable mutually agreeable approaches will be designed consistent with Government practices and JICA's Policy.

76. Land acquisition and involuntary resettlement will be avoided where feasible, or minimized, by identifying possible alternative project designs that have the least adverse impact on the communities in the project area.

77. Where displacement of households is unavoidable, all PAPs (including communities) losing assets, livelihoods or resources will be fully compensated and assisted so that they can improve, or at least restore, their former economic and social conditions.

78. Compensation and rehabilitation support will be provided to any PAPs, that is, any person or household or business which on account of project implementation would have his, her or their:

- Standard of living adversely affected;
- Right, title or interest in any house, interest in, or right to use, any land (including premises, agricultural and grazing land, commercial properties, tenancy, or right in annual or perennial crops and trees or any other fixed or moveable assets, acquired or possessed, temporarily or permanently;
- Income earning opportunities, business, occupation, work or place of residence or habitat adversely affected temporarily or permanently; or
- Social and cultural activities and relationships affected or any other losses that may be identified during the process of resettlement planning.

79. All affected people will be eligible for compensation and rehabilitation assistance, irrespective of tenure status, social or economic standing and any such factors that may discriminate against achievement of the objectives outlined above. Lack of legal rights to the assets lost or adversely affected tenure status and social or economic status will not bar the PAPs from entitlements to such compensation and rehabilitation measures or resettlement objectives. All PAPs residing, working, doing business and/or cultivating land within the project impacted areas as of the date of the latest census and inventory of lost assets(IOL), are entitled to compensation for their lost assets (land and/or non-land assets), at replacement cost, if available and restoration of incomes and businesses, and will be provided with rehabilitation measures sufficient to assist them to improve or at least maintain their pre-project living standards, income-earning capacity and production levels.

80. PAPs that lose only part of their physical assets will not be left with a portion that will be inadequate to sustain their current standard of living. The minimum size of remaining land and structures will be agreed during the resettlement planning process.

81. People temporarily affected are to be considered PAPs and resettlement plans address the issue of temporary acquisition.

82. Where a host community is affected by the development of a resettlement site in that community, the host community shall be involved in any resettlement planning and decision-making. All attempts shall be made to minimize the adverse impacts of resettlement upon host communities.

83. The resettlement plans will be designed in accordance with Uzbekistan's Land law and JICA's Policy on Involuntary Resettlement.

84. The Resettlement Plan will be translated into local languages and disclosed for the reference of PAPs as well as other interested groups.

85. Payment for land and/or non-land assets will be based on the principle of replacement cost.

86. Compensation for PAPs dependent on agricultural activities will be land-based wherever possible. Land-based strategies may include provision of replacement land, ensuring greater security of tenure, and upgrading livelihoods of people without legal land titles. If replacement land is not available, other strategies may be built around opportunities for re-training, skill development, wage employment, or self-employment, including access to credit. Solely cash compensation will be avoided as an option if possible, as this may not address losses that are not easily quantified, such as access to services and traditional rights, and may eventually lead to those populations being worse off than without the project.

87. Replacement lands, if the preferred option of PAPs, should be within the immediate vicinity of the affected lands wherever possible and be of comparable productive capacity and potential. As a second option, sites should be identified that minimize the social disruption of those affected; such lands should also have access to services and facilities similar to those available in the lands affected.

88. Resettlement assistance will be provided not only for immediate loss, but also for a transition period needed to restore livelihood and standards of living of PAPs. Such support could take the form of short-term jobs, subsistence support, salary maintenance, or similar arrangements.

89. The resettlement plan must consider the needs of those most vulnerable to the adverse impacts of resettlement (including the poor, those without legal title to land, ethnic minorities, women, children, elderly and disabled) and ensure they are considered in resettlement planning and mitigation measures identified. Assistance should be provided to help them improve their socio-economic status.

90. PAPs will be involved in the process of developing and implementing resettlement plans.

91. PAPs and their communities will be consulted about the project, the rights and options available to them, and proposed mitigation measures for adverse effects, and to the extent possible be involved in the decisions that are made concerning their resettlement.

92. Adequate budgetary support will be fully committed and made available to cover the costs of land acquisition (including compensation and income restoration measures) within the agreed implementation period. The funds for all resettlement activities will come from the Government.

93. Displacement does not occur before provision of compensation and of other assistance required for relocation. Sufficient civic infrastructure must be provided in resettlement site prior to relocation. Acquisition of assets, payment of compensation, and the resettlement and start of the livelihood rehabilitation activities of PAPs, will be completed prior to any construction activities, except when a court of law orders so in expropriation cases. (Livelihood restoration measures must also be in place but not necessarily completed prior to construction activities, as these may be ongoing activities.)

94. Organization and administrative arrangements for the effective preparation and implementation of the resettlement plan will be identified and in place prior to the commencement of the process; this will include the provision of adequate human resources for supervision, consultation, and monitoring of land acquisition and rehabilitation activities.

95. Appropriate reporting (including auditing and redress functions), monitoring and evaluation mechanisms, will be identified and set in place as part of the resettlement management system. An external monitoring group will be hired by the project and will evaluate the resettlement process and final outcome. Such groups may include qualified NGOs, research institutions or universities.

96. The cut-off-date of eligibility refers to the date prior to which the occupation or use of the project area makes residents/users of the same eligible to be categorized as PAPs and be eligible to Project entitlements. In the Project, the cut-off date is the first date of census survey including illegal households. The establishment of the eligibility cut-off date is intended to prevent the influx of ineligible non-residents who might take advantage of Project entitlements

97. Principle of Replacement Cost: All compensation for land and non-land assets owned by households/shop owners who meet the cut-off-date will be based on the principle of replacement cost.

Replacement cost is the amount calculated before displacement which is needed to replace an affected asset without depreciation and without deduction for taxes and/or costs of transaction.

VII.3. Comparison of Uzbek and JICA Guidelines, Regulations and Procedures

98. The main variations between Uzbekistan laws/regulation and JICA IR policy are outlined in Annex 1. Any key differences have been resolved in favor of JICA policy, particularly in areas where practices are less subject to independent oversight.

99. Comparison of the Uzbekistan LAR Policy with the JICA Involuntary Resettlement Policy indicates that key elements of the JICA Policy are present – particularly those related to valuation of immovable property. The JICA's principle of avoidance or minimization of resettlement is reflected in Uzbekistan Legislation.

100. The key policy difference regards DPs without title, or registration (businesses and structures). In order to remedy this, Uzbekistan has ensured that all land and structures will be registered prior to resettlement, at no cost to the DP, and then transferred or compensated under the relevant entitlement.

101. Overall, Uzbekistan's Country Safeguard System (CSS) is approaching that of JICA Guidelines for Environment and Social Consideration. The main area of concern is the application of laws in practice before and during construction – where differences have been noted in the field. This is mainly an issue of information dissemination to those responsible for implementation at the district level. This has been addressed in the information dissemination activities during preparation, and will be a core area for the monitoring activities during the LAR update and implementation.

VII.4. Actions Made to Address the Gaps

102. In this section, it will be necessary to mention measures taken to overcome the gaps in Uzbek legislation and JICA's policy towards involuntary resettlement. Please refer to the following table 13;

Table 13: Comparison of JICA and Uzbekistan Policy Pertaining to Land Acquisition and Resettlement

JICA Resettlement Policy	Uzbekistan Law	Remarks/Conclusions
DPs should be involved in meaningful consultation	DPs are involved in Province and Government officials	National legislation does not provide for public consultation This LARAP provides for meaningful consultation and information dissemination
Preference will be given to land-based resettlement strategies for displaced persons whose livelihoods are land-based	Since the Land is owned by state, Land Code does not recognize individual ownership of land, but only permits use of land	Practice has to be in conformance
Lack of title should not be a bar to compensation or rehabilitation secured tenure to relocation land Untitled land owners are eligible for compensation for improvements to the land, at full replacement cost	People apply for registration for a particular land use Untitled land use is ineligible for compensation	Non-titled land user will receive either rehabilitation assistance equal to the land improvements they have undertaken after they register it accordingly at Project cost; or, Equivalent land titled similar to those with title
All houses/buildings are compensated for damage or demolition caused by a project irrespective of the status of formal title	All houses/buildings/shops which are registered under Land Code are valued at the respective regional/district level Unregistered buildings are not liable for compensation	All buildings compensated at current replacement cost (not market value) Unregistered buildings will be registered at project cost, prior to compensation
Prompt replacement of assets with better housing at resettlement sites with comparable access to employment and production opportunities Pay compensation and provide other resettlement entitlements before physical or economic displacement	Buildings are compensated at replacement value Payments are not made during construction	All buildings are compensated at current replacement cost (not market value) 100%of payments to be made prior to resettlement Resettlement to be completed prior to road construction beginning
Crop losses compensation to be provided to landowners and sharecroppers/lease tenants whether registered or not	Construction waits for harvest. If unable to wait then crops are compensated No compensation unless titled land	Titled and non-title downers will receive full compensation for all losses of trees and standing crops Untitled land will be registered at no cost to allow compensation to be paid
DPs should be compensated for all their losses at replacement cost	A commission will assess value of agricultural land; loss of crop/tree income; and market value for lands appropriated	All losses are at replacement cost –in the case of land, crops, trees etc. this is based on prevailing market rates
DPs should be timely compensated	Compensation will occur prior to construction of works	In compliance. All LAR activities, compensation, finalization of relocation, construction of replacement assets will occur prior to Construction

JICA Resettlement Policy	Uzbekistan Law	Remarks/Conclusions
DPs should be compensated and/or assisted, so that their economic or social future is generally as favorable as it would have been without the Project	RU law has social policies for all citizens. No specific policy directed at DPs	JICA Policy is followed using livelihood allowances and income/social restoration activities
Assess past and current involuntary resettlement risks	Only the current IR situation is assessed, whether legal or not	Where fees and taxes have been charged due to initial project preparation (such as title and registration charges), these will be repaid by the project following formal application to grievance committee
Pay particular attention to vulnerable groups especially those below the poverty line, the landless, the elderly, women and children, and indigenous peoples, and those without legal title to land	All DPs are treated equally under Uzbek Law	The LARP will include schemes and benefits targeted at vulnerable groups
Establish a grievance redress mechanism to receive and facilitate resolution of the affected persons' concerns	Resettlement has a standard mechanism to address grievances	Practice has to be in conformance
Provide DPs with transitional support and development assistance, such as land development, credit facilities, training, or employment opportunities	No specific policy. Covered under RU social policies	The JICA's policy will be followed where possible with activities contained in the GAP
Improve the standards of living of the displaced poor and other vulnerable groups, including women, to at least national minimum standards	RU policy relates to compensation only. Living standard improvement applies to all citizens. DPs are not specifically targeted	JICA's policy is to ensure that all DPs are brought up to minimum standards through the project. This relates to land, housing and livelihood
Develop procedures in a transparent, consistent, and equitable manner Ensure coercion or power differentials do not adversely impact DPs negotiations or grievances	RU policy ensures that all negotiations are conducted in an equitable and transparent manner	Practice has to be in conformance Monitoring will ensure that these policies are followed

103. The actions taken should be reflected in Minutes of Meeting prepared and signed by UE. This document should guarantee the following:

- Compensation will be provided for all relocated residential and household outbuildings at the market prices existing at the moment of resettlement.
- Those APs who do not have proprietary rights will be provided with means of existence for rehabilitation at the new place.
- APs from vulnerable groups will be provided with additional subsidies or assistance.
- All APs having land plots will be provided with similar land plots at the new place.

VII.5. Principles and Policies for the Project

104. The JICA's policy regarding involuntary resettlements lies in the fact that the valuation of DPs' property and assets should be at the replacement value. The JICA's practices also recognize this principle to ensure protection of interests and the well-being of the DPs.

105. The LARAP sets eligibility and entitlement provisions establishing compensation rates in accordance with guidelines from the Land Code of the Republic of Uzbekistan and JICA Guidelines for Environmental and Social Considerations.

106. The compensation policy is as follows;

Cut-off date

- According to Chapter V, the first public consultation was held on 20th December, 2011. On that day, the project outline, land acquisition and resettlement has been noticed to the affected 33 households. Therefore, 20th December, 2011 has been decided as Cut-off date for this project.

Compensation for Land

- 23 households are entitled to receive land compensation of 0.06 ha per each household.
- 23 households have been/will be registered by Land Cadastre so that they can hold the right to use the land. Then they will receive the compensation.
- In addition to the 0.06 ha of land compensation, the legal households (23 HHs), that own more than 0.06 ha of their building area, are entitled to receive monetary compensation.

Compensation for Buildings, Tree

- Monetary compensation for buildings, trees, crops, etc. are provided based on the replacement cost researched by the survey which is been conducted by an independent evaluation consultant/agency that "Uzbekenergo" hires.
- 23 households which are not engaged in agriculture will not be compensated for crops since they do not earn their living with crops.
- The expense for the houses of 10 uninhabited illegal households will be paid by Navoi TPS as an support activity. Karamana District has discussed with each household and 10 households have decided amount of expenses by themselves. Karamana District has requested UE to pay the expenses.

Responsibility

- All the compensation cost will be paid by "Uzbekenergo".
- As for land compensation, it is Karmana District that will receive budget from Navoi TPS for land compensation and provide the land (0.06 ha per household) to the affected households.

- As for monetary compensation for other assets including insufficient land, trees, it is "Uzbekenergo" that will pay the compensation directly to the affected households.

107. The following principles for the compensation/rehabilitation of families affected by the Project were explained to the DPs and stakeholders during consultations:

- There will be some permanent acquisition of land and buildings. Identification compensation and assistance will be provided prior to any construction commencing.
- All affected persons (APs) (identified before the cut-off date) will receive compensation even if they are without title or formal recognition. This includes any temporary residential structures, informal agricultural activities or temporary business use.
- All construction through agricultural land will be timed to minimize any impacts on the income and activities of adjoining land parcels.
- A defined grievance procedure has been established. When a land owner or user does not agree with a decision regarding compensation or change of the ownership or land use (lease), it may not be exercised before the dispute is resolved judicially. In addition, any person who feels that they are in any way worse off can take their grievance to the highest level, at the cost of the project.
- Those people who face significant impacts (more than 10% of their land being affected and/or physically displaced from housing) will receive additional support, assistance and compensation.
- Vulnerable groups, including female-headed households, the poor, disabled, or families with significant numbers of elderly members will receive additional support, assistance and compensation to ensure that they are not severely affected.
- DPs may use and exercise their rights to a land plot and make necessary expenditures in compliance with its purpose after notification on acquisition for public needs until compensation is agreed. However, there will be no entitlement to additional compensation based on these improvements.

VIII. ENTITLEMENTS, ASSISTANCE, AND BENEFITS

108. This section outlines DP's entitlements and eligibility and describes all resettlement assistance measures including an entitlement matrix. It also specifies all assistance to vulnerable groups, including women, and other special groups; and outlines opportunities for affected persons to derive appropriate development benefits from the project.

VIII.1. Entitlements for Compensation

109. The following groups of affected persons (APs) are included in the LAR and also will be addressed in this Land Acquisition and Resettlement Action Plan (LARAP) for the Project:

- all DPs losing land either with legal title, lease holding land rights or without legal status,
- owners of buildings, crops, plants, or other objects attached to the land (registered and unregistered).

VIII.2. Formalization of Title/Registration

110. To enable the Project to compensate unregistered land users under Uzbekistan laws, representatives from the District Cadastral Offices have advised affected land users to register or update the registration of their lands and structures. Under the LARAP those who have unregistered land or structures will be registered free of charge prior to compensation. This will be facilitated by the UE.

111. The assets/structures on the affected plots of land users without titles shall be evaluated by exactly the same criteria as those with titles.

VIII.3. Calculation of Compensation and support

112. This section will outline how compensation has been calculated for each component of the RP, and a summary of that calculation.

1. Land

113. Compensation for the land will be on a "land for land" basis, with land being provided to owners by the District Hokimiyat following assessment by LARC. Such land will be of equal value/productivity in a nearby location and with comparable associated services/ facilities, or compensation to provide such services. Transaction cost, registration fees, if any, will be borne by the Project.

114. For DPs using land without a formal lease, their land will be formalized without any cost to the DP. The land will then proceed under normal process.

115. A total of 3.11 hectare of land is required for the Project. All DPs will lose 100% of their land. Table 13 shows a summary of the land required.

Table 14. Land Required for the Project				
No	**Household No.**	**Land (ha)**		
		Total	**Acquired**	**%**
Makhalla "Uyrot"				
1	Household No. 1	0.07	0.07	100%
2	Household No. 2	0.33	0.33	100%
3	Household No. 3	0.06	0.06	100%
4	Household No. 4	0.13	0.13	100%
5	Household No. 5	0.03	0.03	100%
6	Household No. 6	0.28	0.28	100%
7	Household No. 7	0.08	0.08	100%
8	Household No. 8	0.18	0.18	100%
9	Household No. 9	0.07	0.07	100%
10	Household No. 10	0.06	0.06	100%
11	Household No. 11	0.17	0.17	100%
12	Household No. 12	0.24	0.24	100%
	Total for makhalla "Uyrot"	**1.70**	**1.70**	**100%**
Makhalla "Yangiobod"				
13	Household No. 13	0.02	0.02	100%
14	Household No. 14	0.14	0.14	100%
15	Household No. 15	0.01	0.01	100%
16	Household No. 16	0.02	0.02	100%
17	Household No. 17	0.06	0.06	100%
18	Household No. 18	0.07	0.07	100%
19	Household No. 19	0.05	0.05	100%
20	Household No. 20	0.07	0.07	100%
21	Household No. 21	0.05	0.05	100%
22	Household No. 22	0.06	0.06	100%
23	Household No. 23	0.08	0.08	100%
	Total for makhalla "Yangiobod"	**0.63**	**0.63**	**100%**
	Total for both makhallas	**2.33**	**233**	**100%**
"Illegal persons" from makhalla "Yangiobod"				
24	Household No. 24	0.06	0.06	100%
25	Household No. 25	0.08	0.08	100%
26	Household No. 26	0.08	0.08	100%
27	Household No. 27	0.08	0.08	100%
28	Household No. 28	0.12	0.12	100%
29	Household No. 29	0.08	0.08	100%
30	Household No. 30	0.08	0.08	100%
31	Household No. 31	0.08	0.08	100%
32	Household No. 32	0.06	0.06	100%
33	Household No. 33	0.06	0.06	100%
	Total for "Illegal persons"	**0.78**	**0.78**	**100%**

2. Land Preparation

116. Land development will be implemented using the machines and manpower of Navoi TPS and the expense is not included in the budget.

117. The expense for land preparation will be paid to Karamana District by UE. The expense is shown in Table 15.

Table 15. Land Preparation Costs

Item	Units	'000 UZS	USD
Payment to Karamana District	23	20,000	10,361
TOTAL	23	**20,000**	**10,361**

3. Structures and Trees

118. All registered assets were valued by independent evaluation agency[8] through calculating the real replacement cost based on cost of materials, type of construction, labor, transport and other construction costs.

119. Table16 shows the compensation for all buildings based on assessment of local cadastral services and the independent agency[9]. Total buildings replacement cost for 23 legal DPs is 1,233,656,000UZS ($641,501).

120. Monetary support for 10 illegal DPs by UE is 39,400,000UZS ($20,488).

121. Table 17 shows the compensation for all types of trees based on assessment of local cadastral services and the independent agency. Total trees replacement cost for 23 legal DPs is 7,831,000UZS ($4,072).

4. Crop

122. The resettled households are not engaged in agriculture and will not be compensated for crops

5. Businesses

123. There are no any operating businesses (neither registered nor unregistered) in the resettlement area. So, no need to pay any compensation for businesses or employed workers.

6. Community Assets

124. The public infrastructure will not be damaged by the resettlement.

[8] This is "Navoiy Baxolashva Konsalting Markazi", LTD. The address: 210100, Navoi city, P. Ochilov Street, 24. Tel/Fax: 224-9221. The valuation report was registered by number No. 327 of 28 September 2012. Director of the company – N. M. Abdullaev.
[9] See Annex 9.

Table 16. Compensation and support for Structures				
No	**Household Number**	**Type of structure**	**Affected area (m^2)**	**Calculation of compensation ('000 UZS)**
Makhalla "Uyrot"				
1	Household No. 1	Housing and household outbuildings	405.0	54,775
2	Household No. 2	Housing and household outbuildings	1,460.3	333,143
3	Household No. 3	Housing and household outbuildings	258.3	38,771
4	Household No. 4	Housing and household outbuildings	524.2	77,062
5	Household No. 5	Housing and household outbuildings	385.4	72,133
6	Household No. 6	Housing and household outbuildings	323.2	56,347
7	Household No. 7	Housing and household outbuildings	158.4	30,729
8	Household No. 8	Housing and household outbuildings	310.9	73,982
9	Household No. 9	Housing and household outbuildings	167.8	27,507
10	Household No. 10	Housing and household outbuildings	227.2	29,035
11	Household No. 11	Housing and household outbuildings	177.1	45,399
12	Household No. 12	Housing and household outbuildings	348.1	60,040
	Total for makhalla "Uyrot"		**4,745.9**	**898,923**
Makhalla "Yangiobod"				
13	Household No. 13	Housing and household outbuildings	275.0	55,879
14	Household No. 14	Housing and household outbuildings	158.9	18,506
15	Household No. 15	Housing and household outbuildings	47.5	9,680
16	Household No. 16	Housing and household outbuildings	168.6	18,389
17	Household No. 17	Housing and household outbuildings	108.2	14,276
18	Household No. 18	Housing and household outbuildings	219.5	35,610
19	Household No. 19	Housing and household outbuildings	173.0	27,742
20	Household No. 20	Housing and household outbuildings	215.2	35,861
21	Household No. 21	Housing and household outbuildings	160.7	30,140
22	Household No. 22	Housing and household outbuildings	192.1	36,074
23	Household No. 23	Housing and household outbuildings	293.5	52,578
	Total for makhalla "Yangiobod"		**2,012.2**	**334,733**
	Total for both makhallas (000' UZS)			**1,233,656**
	Total for both makhallas (USD)			**641,501**
"Illegal persons" from makhalla "Yangiobod"				
24	Household No. 24	basis	54	4,500
25	Household No. 25	basis	180	4,300
26	Household No. 26	basis	192	2,300
27	Household No. 27	basis	178	5,500
28	Household No. 28	basis	200	4,000
29	Household No. 29	basis	108	5,000
30	Household No. 30	basis	76	5,500
31	Household No. 31	basis	92	2,500
32	Household No. 32	basis	45	2,300
33	Household No. 33	basis	103	3,500
	Total for "Illegal persons"		**1,228.0**	**39,400**
	Total for "Illegal persons" (000' UZS)			**39,400**
	Total for "Illegal persons" (USD)			**20,488**

Table 17. Compensation for Trees				
No	**Household Number**	**Type of structure**	**Affected trees**	**Calculation of compensation ('000 UZS)**
Makhalla "Uyrot"				
1	Household No. 1	Trees	35	333
2	Household No. 2	Trees	6	70
3	Household No. 3	Trees	33	242
4	Household No. 4	Trees	39	127
5	Household No. 5	Trees	2	34
6	Household No. 6	Trees	98	1,675
7	Household No. 7	Trees	23	223
8	Household No. 8	Trees	161	1,555
9	Household No. 9	Trees	21	240
10	Household No. 10	Trees	77	799
11	Household No. 11	Trees	28	336
12	Household No. 12	Trees	129	1,434
		Total for makhalla "Uyrot"	652	7,068
Makhalla "Yangiobod"				
13	Household No. 13	Trees	78	623
14	Household No. 14	Trees	13	23
15	Household No. 15	Trees		
16	Household No. 16	Trees		
17	Household No. 17	Trees		
18	Household No. 18	Trees		
19	Household No. 19	Trees	23	117
20	Household No. 20	Trees		
21	Household No. 21	Trees		
22	Household No. 22	Trees		
23	Household No. 23	Trees		
		Total for makhalla "Yangiobod"	114	763
			Total for both makhallas (000' UZS)	**7,831**
			Total for both makhallas (USD)	**4,072**

VIII.4. Valuation Process

125. **Asset Valuation. –** Initial asset (buildings) valuation shall be undertaken by an independent valuation firm based on replacement cost. Then, it will be verified and certified first by the UE Social and Land Acquisition sub-Unit and then by the District LARC. If the DP agrees with the valuation, then this will be used as the basis of negotiation between the owners and the local authorities. If the DP disagrees with the valuation, Uzbek Law (Cabinet of Ministers Resolution No. 97 dated of May 29, 2006) allows utilizing an independent valuation firm at their own cost. In conformity with JICA requirements, this cost will be paid by the UE. It is possible also to recourse to the grievance committee if agreement cannot be reached.

126. **Land for Land. –** The District LARC decides on the assignment of alternative land plots. Given the lack of complexity in this project and the large extent of land available (according to Karmana District Hokim), the households are going to be relocated within the same settlement, at a distance of, approximately, 2-3 kilometers from their current location. Please see paragraph 129 and 130 as well.

VIII.5. Entitlement Matrix

127. Table 18 outlines the complete entitlement matrix for the project.

Table 18: Entitlement Matrix

Loss Item 1: Residential Land			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Land compensation of 0.06 ha per each household.	1. Karmana District will receive budget from Navoi TPS for land compensation and provide the land (0.06 ha per household) to the affected households.	1. Legal owners will be assisted by UE to organize legal documents in support of their ownership. 2. The households which own more than 0.06 ha of their building area, are entitled to receive monetary compensation or land compensation for the additional land (per ha).
Loss Item 2: Housing and structures			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Replacement Value of Housing and structures	1. Replacement Value will be recommended by the independent agency. 2. Project owner will pay cash compensation under law for the land to APs. 3. If Replacement value is higher than law, the difference will be paid by project owner.	1. Legal owners will be assisted by UE to organize legal documents in support of their ownership. 2. Regarding the 10 uninhabited illegal houses, the expense for the houses will be paid by the Navoi TPS as a support activity.
Loss Item 3: Standing Trees			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
1. Legal owner(s) as identified by Karamana District in the process of payment	1. Replacement Value of Standing Trees	1. Replacement Value will be recommended by the independent agency. 2. Project owner will pay cash compensation under law for the land to APs. 3. If Replacement value is higher than law, the difference will be paid by project owner.	
Livelihood Restoration			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
PAPs whose livelihood level are lowered after the relocation	1.Job training 2.Preferential hiring for works in Navoi Thermal Power Plant	1.Identifying PAPs whose livelihood levels are lowered after the relocation. 2.Uzbekenergo will provide job trainings. 3.Navoi Thermal Power Plant will hire	

		some of them if necessary.	
Support for Vulnerable Groups			
Unit of entitlement	**Entitlements**	**Application Guidelines**	**Additional Services**
Households who are regarded as vulnerable	1.Support for receiving public assistance. 2.Providing assistances such as training, job-opportunities, and allowances	1.Identifying the number of PAPs who are categorized in vulnerable groups. 2.Uzbekenergo will assist the application process for the public assistance. 3.Uzbekenergo will provide assistances such as training, job-opportunities, and allowances following the established order in accordance with the regulations of Uzbekistan.	

128. The Table 18 was made based on JICA's Guidelines for Environmental and Social Considerations and The World Bank's Operational Policy (OP 4.12 – Involuntary Resettlement).

VIII.6. Relocation Land

129. Relocation lands are located to the makhallas named "Honchorbog" and "Ayronchi" with total areal size 2.2 ha. The lands are belonged to the District. It is just a few km away from the Navoi TPS. The residents can use the school, hospital, drugstore, public bathhouse conveniently. The new land plots are in the living center of "Yangi-Aryk" village and this area is provided by power line, gas pipeline and central cold water supply. The lands are near the existing roads and the bus line is on the road. In the surrounding area, there are houses and agricultural lands, but no industrial plants. Figure 2 shows the location of current residential area and new land plots.

130. There are photos of the relocation land plots (see Annex 8). As is clear from these photos the land plots unusable for the construction today. It is required the grubbing, land forming and laying out of the plots by parcels. The lands will be ready for building the houses by Feb 2014.

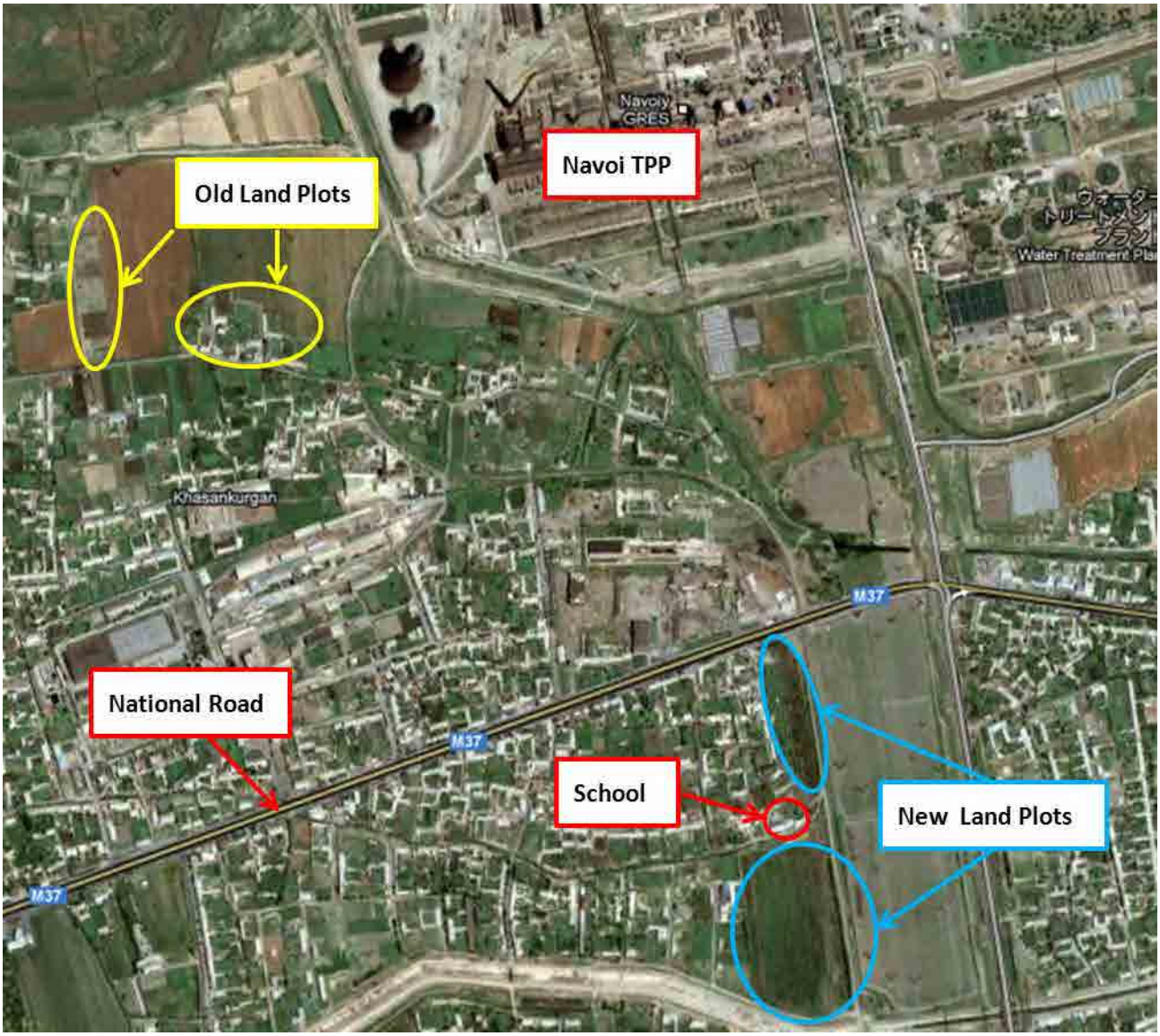


Figure 2: Location of Old and New Land Plots

IX. RELOCATION OF HOUSING AND SETTLEMENTS

131. This section describes the options for relocating housing and the activities that will be conducted to assist the process.

132. The District LARC assesses options for relocation of affected 23 households. It is expected that in all cases they will be reallocated land close to their current plots.

133. The Karmana District Hokimiyat has to approve that affected 23 households will be provided with appropriate lands in the same area. Decrees of District Hokimiyat regarding ownership of corresponding lands will be also issued, in which a particular new land will be indicated. This will be done prior the construction of civil work.

134. Regarding relocation places, please refer to the paragraph 129 and 130.

X. INCOME RESTORATION AND REHABILITATION

135. This section briefly describes programs for restoring and enhancing income of vulnerable groups, particularly women and the disabled.

136. Since relocation place is better environmental circumstance than the current place. And infrastructure such as supply of tap water, gas and electricity is in place. Therefore, it is not considered that it is necessary to support restoring and enhancing income of vulnerable groups, particularly women and the disabled.

X.1. Opportunities to Derive Development Benefits

137. **Priority Work Placement.** –All DPs and project stakeholders will receive priority entitlement to work in construction crews and for rehabilitation efforts (such as tree replanting).The standards will be incorporated in construction contracts and details included in progress reports.

X.2. Other Costs

138. Other costs to be provided under the LARAP include cost of resettlement consultants. Table 19 outlines the cost of providing these services and the agency responsible for payment. However Resettlement consultant is to be estimated later because TOR of Resettlement consultant is not determined yet.

Table 19. Other Costs ('000 UZS)

Item	Amount	Responsible Agency
Resettlement Consultants under PIU	to be estimated later	State Joint Stock Company "Uzbekenergo"
Total ('000 UZS)	to be estimated later	
Total (USD)	to be estimated later	

139. The tasks of resettlement consultant will include but not be limited to the following:

- Manage and coordinate the preparation, updating, implementation and monitoring the approved Land Acquisition and Resettlement Action Plan (LARAP).
- Set up internal monitoring system on the project's social and resettlement issues and requirements.
- Select and review an External Monitoring Agency (EMA) to be approved by the Program's Director.
- Project Information Management and Development.
- Assess and prepare capacity building program on social issues.
- Conduct internal and external coordination with relevant parties in social/resettlement activities according to requirements of the project.
- Set up redress and grievance mechanism for project activities.
- Report preparation and submission.

- Provide advice/recommendation to the Director, PIU on social safeguard/resettlement problems/ requirements.
- Redress or follow up actions based on findings and requirements of EMA reports.
- Provide independent monitoring on the contractors' compliance to (a) core labor standards, labor laws and incorporate applicable workplace occupational safety norms; (b) no differentiation of payment between men and women for work of equal value; (c) no child labor in the construction and maintenance activities; (d) no forced or compulsory labor; (e) discrimination in respect of employment; (f) freedom of association; (g) to the extent possible, maximize employment of local poor and disadvantaged persons for project construction purposes, provided that the requirements for job and efficiency are adequately met; and (h) land acquisition and resettlement framework and plans.
- Engage with relevant civil society organizations interested in the project implementation.
- Update the livelihood assistance program and support implementing the livelihood assistance program.
- Survey of full replacement cost.
- Support to make monitoring report which will be submitted to JICA.

XI. RESETTLEMENT BUDGET AND FINANCIAL PLAN

140. This section provides an itemized budget for all resettlement activities, including for the resettlement unit, staff training, monitoring and evaluation, and preparation of resettlement plans during loan implementation.

XI.1. Responsibilities

141. In order to ensure that sufficient funds are available for LAR tasks, "Uzbekenergo" will have to allocate 100% of the cost of compensation at replacement cost and expected allowances estimated in each LARAP plus contingencies before LARAP implementation. Uzbekenergo will be responsible for timely allocating the funds to implement the LARAP. Allocations will be reviewed bi-annually based on budget requirements indicated in the LARAP/RP.

142. The UE will be responsible for including LAR funds for project activities in each fiscal years government budget. The budget for LARAP/RP will be disbursed by UE via the District LAR Committee (LARC) which will in turn distribute the compensation to DPs.

143. The UE is responsible to establish Safeguard Team to conduct their tasks and responsibilities during the Program's activities. This will be funded via the Procurement and Safeguard Support package.

XI.2. Budget Summary

The complete budget for LAR activities on the Project is shown in Table 20. The budget for LAR will come from "Uzbekenergo" as counterpart fund. A total budget is 1,430,976UZS ($744,064).

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Table 20. LAR Budget Summary

	'000 UZS	**$US**
Compensation for land		
Land Preparation Costs*	20,000	10,361
Compensation		
Housing and Structures	1,233,656	641,501
Trees	7,831	4,072
Support and Assistance		
Structures for illegal	39,400	20,488
Other Costs		
Resettlement Consultant under PIU**	to be estimated later	to be estimated later
Sub-Total	**1,300,887**	**676,422**
Contingency (10%)	130,089	67,642
TOTAL	**1,430,976**	**744,064**

*"Land Preparation Costs" may be increased because 20 mil sum is cost of independent company who estimate cost of land and houses only. Other land preparation cost such as land registration cost is not estimated yet.

** Resettlement consultant is to be estimated later because TOR of Resettlement consultant is not determined yet.

XII. INSTITUTIONAL ARRANGEMENTS

144. The main institutions that will be involved in LAR activities are the State Joint Stock Company "Uzbekenergo" as executing agency, PIU (Project Implementation Unit), Design Institute (DI), Project Consultants (PC), Provincial (Province) and District (District) and municipal town authorities, State Unitary Enterprise Land and Immovable Cadastre Service (SUELICS) at district level.

XII.1. State Joint-Stock Company "Uzbekenergo" (SJSC Uzbekenergo)

145. The Uzbekenergo will have overall responsibility for all aspects of the project. The Project Implementation Unit (PIU) within Uzbekenergo will be responsible for the day to day management of the Project including cross-agency coordination for LARAP implementation and monitoring the compensation and disbursement.

146. The PIU will be directly involved in all LAR related planning, implementation, inter-agency coordination, monitoring and reporting.

XII.2. Project Implementation Unit (PIU)

147. The Project Implementation Unit (PIU) will be in charge of elaborating the design and construction documents for the project. It will work to:

- Look for measures and alternatives to avoid and minimize land acquisition and resettlement impacts.
- Assemble all documents required for compensation.
- Carry out topographic surveys of the expropriated land and replacement lands.
- Elaborate layouts indicating the location of the worksites and the permanent infrastructures and the perimeter of the required surfaces differentiating the land use patterns in the areas being occupied to serve as a base for the selection of compensation land.
- Conduct land marking and pegging of the land assigned for temporary use and permanent occupation of acquired land.
- Conduct the internal monitoring according to LARAP.
- Select the independent valuation agencies and independent monitoring agencies for external monitoring.

XII.3. District SUELICS

148. This is a permanent committee at District level. However it plays an enhanced role throughout implementation. It is responsible for:

- Identifying land losses incurred by land owners and land users plus agricultural output losses.
- Determining the need for protective sanitary and water protection zones around constructions.
- Preparing proposals on allocation of land plots of equal value under land for land.
- Approving the Implementation Act and the attached plan.
- Amending government edicts on land use and land ownership as well as other cadaster documents.

XII.4. District Government

149. Local district government involved in the LARAP review and implementation. It will form a district land acquisition and resettlement committee (LARC) which will undertake the following:

- Outline locations of constructions and structures affected by the project.
- Select land for construction sites.

- Prepare and approve legislation for the right (title) to use land plots.
- Approve the Act for the right to use the land plot.

150. In addition to permanent members, the Committee may include representatives of Uzbekenergo, as well as affected legal entities and individuals (DPs).

151. The LARC will also estimate losses of land owners and land users in accordance with JICA specifications in addition to losses resulting from land acquisition based on data provided by the independent valuation agency. The Committee will prepare Acts for the right to specific plots of land specifying the acquired land area and losses and allowances as determined under the LARAP entitlement matrix.

152. It is proposing that LARC will compose of the following members:

- Uzbekenergo PIU.
- District Department of SUELICS.
- District Department of Agriculture and Water Resources.
- District Department of Environmental Protection.
- Makhallas' leaders.
- Representatives of the affected people.

153. All affected legal parties and individual persons (or their legal representatives) will have representation on the committee. Besides state organizations and structures and makhalla authorities will be involved in resettlement activities to ensure the legal rights and interests of land users who are subject to land acquisition and resettlement.

XII.5. District Grievance Redress Committee (GRC)

154. This is a permanent committee at District level based at GFP (see Chapter VI.2) that has to function during all period of the resettlement process. It is responsible for:

- Reception and reviewing questions and/or complaints on the part of DPs.
- Informing for the District SUELICS on the questions/complaints for resolution.

XII.6. Supervision Consultants (Internal Monitoring)

155. The Supervision Consultants should be selected by PIU. They are responsible for:

- Supervision and information exchange with District SUELICS regarding to the resettlement process.
- Monthly reporting to the PIU regarding to the resettlement process.

XII.7. External Monitoring Agency (EMA)

156. The External Monitoring Agency (EMA) should be selected by PIU and approved by JICA. It is responsible for:

- Monitoring of the activities of District Grievance Redress Committee.
- Monitoring of the activities of District SUELICS.
- Monitoring of the activities of Supervision Consultants.
- Monthly reporting to JICA regarding to the resettlement process and activities of all institutions involved to the resettlement process.

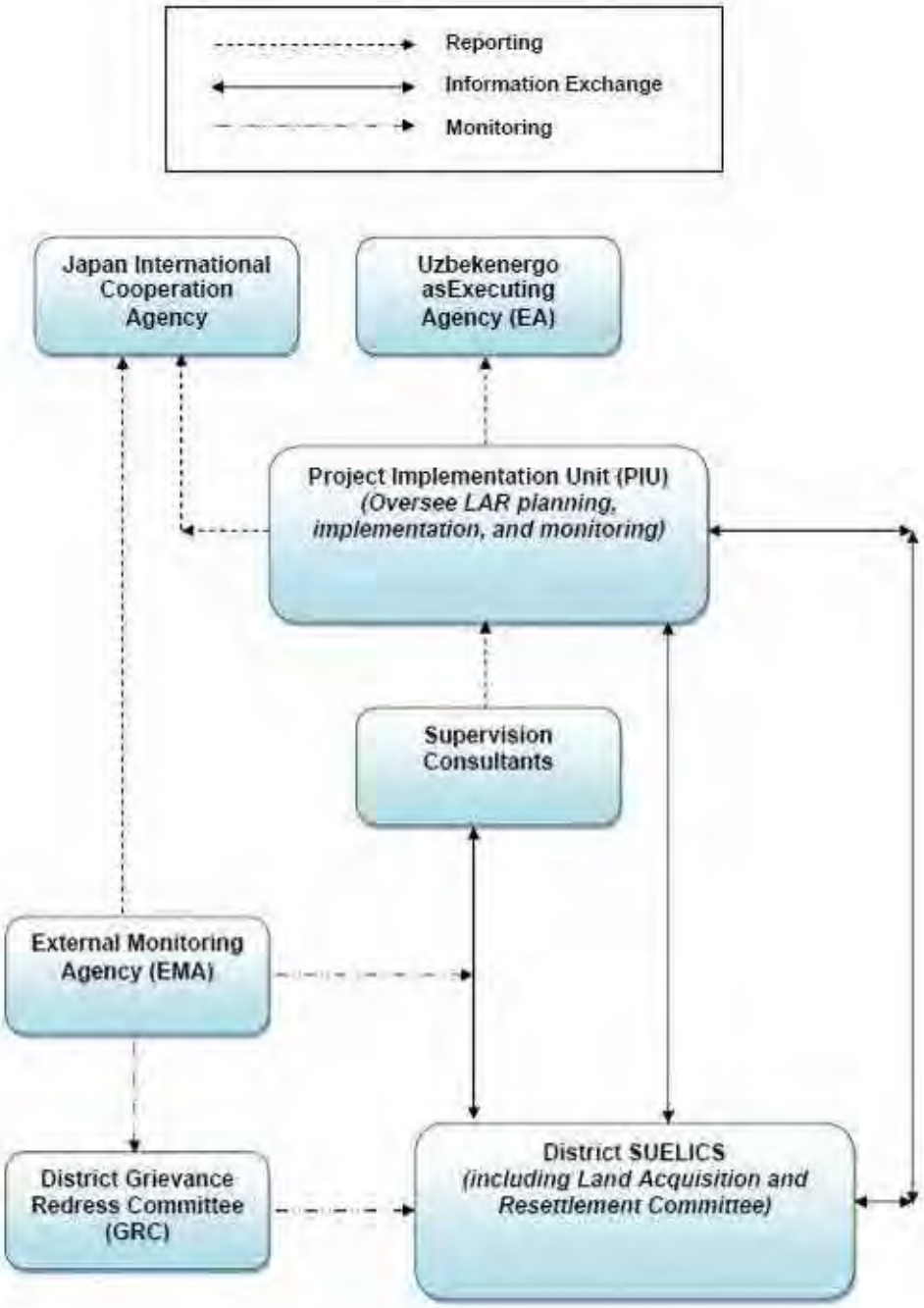


Figure 3.Project Implementation Diagram

XIII. IMPLEMENTATION SCHEDULE

157. This section includes a detailed, time bound, implementation schedule for all key resettlement and rehabilitation activities synchronized with the project schedule of civil works construction.

XIII.1. Pre-Resettlement Activities

158. The UE will undertake a brief verification of the RP based on the alignment finalized by the detailed design. Any modifications to the RP will be made, and verified with the UE and the JICA prior to any LAR activities commencing.

159. The RP has to include the full details of all land and resettlement arrangements, including verification of asset viability by the DPs. It is expected that this can take place prior to loan approval by JICA.

160. The Project Implementation Unit (PIU) will be responsible to:

- Assemble all required documents.
- Carry out topographic surveys of the expropriated and compensation lands.
- Elaborate layouts indicating the location of the worksites and the permanent infrastructures and the perimeter of the required surfaces.
- Establish layouts of the lands proposed as option for compensation.
- Conduct the land marking and the pegging of the lands assigned for temporary use and permanent occupation and of the compensation lands.

161. The DPs will sign a document signifying their satisfaction on the compliance of UE on the agreement. The PIU Social/Resettlement Specialist will guide the UE in preparing a pro-forma document to be used for the settlement of obligation in the purchase of affected land and/or materials for all structures.

162. Disbursement of cash will follow the approval of budgets for cash compensation. The PIU will inform the DPs of the schedule of fund release. They will also advise the APs to produce acceptable legal documents pertaining to their identification for claiming the compensation. It is the main responsibility of UE to ensure that all the compensations and entitlements have been paid to and settled with DPs prior to their resettlement.

163. All resettlement activities will be completed prior to clearing the construction sites. The UE will initiate the following steps in releasing the cash compensation and entitlements to DPs:

- The PIU's Resettlement Team will advise the DPs of the fund release schedules.
- The District SUELICS shall then advise the DPs to produce the necessary legal documents for their identification in claiming the compensation and entitlements due to them.
- The Resettlement Team will arrange for receipt of the resettlement compensation and disburse it directly to DPs on presentation of identification.
- The Resettlement Team will arrange for district Hokimiyat to issue new title directly to DPs on presentation of identification.
- The Resettlement Team will require the DPs to sign a document indicating the receipt of their compensation and entitlements.
- The DPs will then begin their process of rebuilding and relocation.
- The Resettlement Team will require the DPs to sign a document indicating completion of their LAR activities, indicating that they have no further claims.
- These activities will be summarized by the UE and forwarded to JICA.

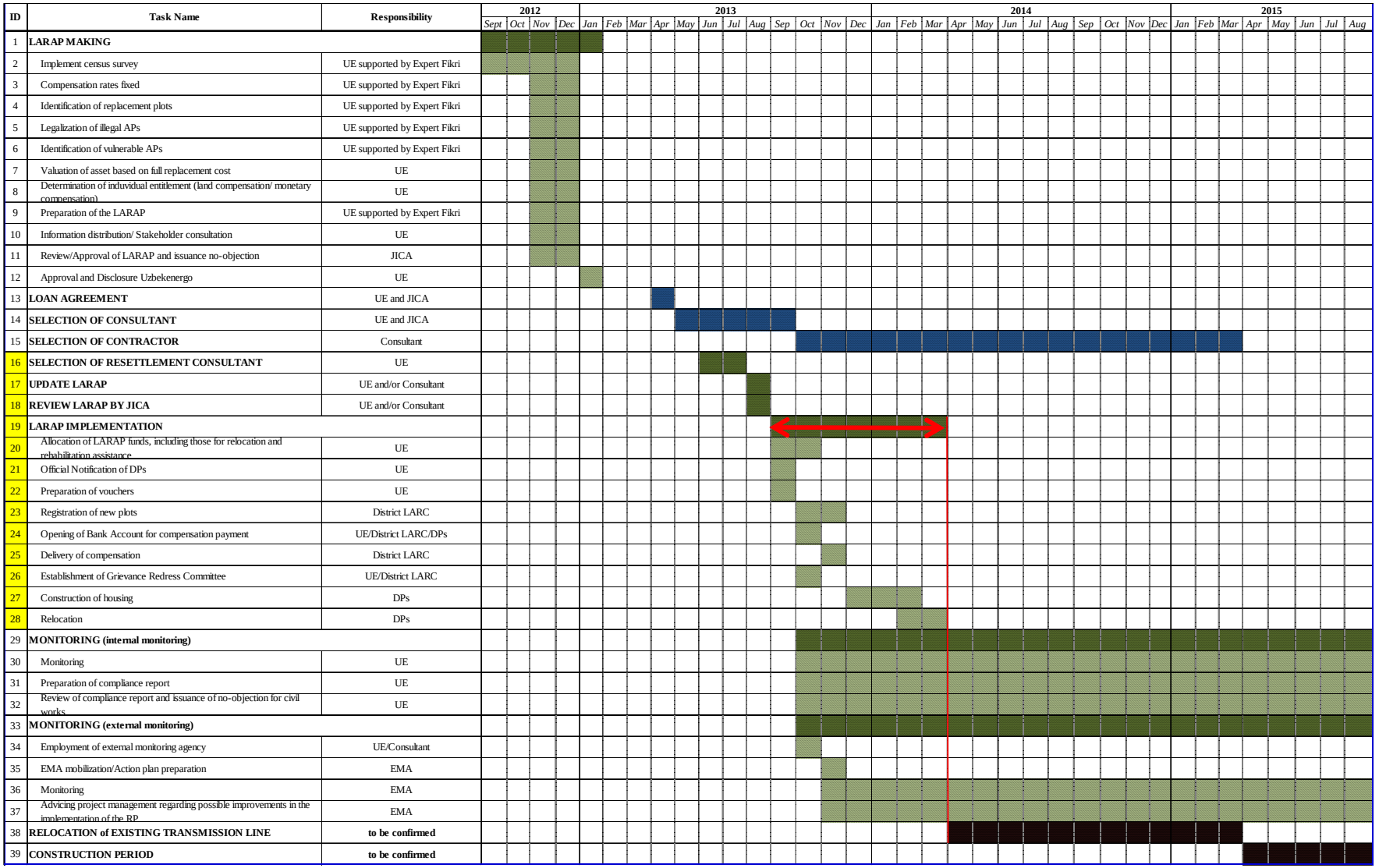
- As a condition to approve the civil works contract award both the RP in English and in Russian/Uzbek will be updated by the Consultant employed by UE of the contractor, re-approved by JICA and re-disclosed to the affected communities.

XIII.2. Implementation Phase

164. The project loan is expected to be approved in April 2013. Construction is set to start at April 2015. A schedule for implementation is presented in Figure 4.

XIII.3. Post-Resettlement Implementation Phase

165. Monitoring of resettlement activities and the compliance of the project policies by PIU of UE, as set out in this framework, are the items for this phase. This is because the internal monitoring which is the responsibility of the Project Implementation Unit (PIU) will be the basis for UE requesting from JICA its "no objection" for the mobilization of construction contractors.



ID	Task Name	Responsibility
1	**LARAP MAKING**	
2	Implement census survey	UE supported by Expert Fikri
3	Compensation rates fixed	UE supported by Expert Fikri
4	Identification of replacement plots	UE supported by Expert Fikri
5	Legalization of illegal APs	UE supported by Expert Fikri
6	Identification of vulnerable APs	UE supported by Expert Fikri
7	Valuation of asset based on full replacement cost	UE
8	Determination of induvidual entitlement (land compensation/ monetary compensation)	UE
9	Preparation of the LARAP	UE supported by Expert Fikri
10	Information distribution/ Stakeholder consultation	UE
11	Review/Approval of LARAP and issuance no-objection	JICA
12	Approval and Disclosure Uzbekenergo	UE
13	**LOAN AGREEMENT**	UE and JICA
14	**SELECTION OF CONSULTANT**	UE and JICA
15	**SELECTION OF CONTRACTOR**	Consultant
16	**SELECTION OF RESETTLEMENT CONSULTANT**	UE
17	**UPDATE LARAP**	UE and/or Consultant
18	**REVIEW LARAP BY JICA**	UE and/or Consultant
19	**LARAP IMPLEMENTATION**	
20	Allocation of LARAP funds, including those for relocation and rehabilitation assistance	UE
21	Official Notification of DPs	UE
22	Preparation of vouchers	UE
23	Registration of new plots	District LARC
24	Opening of Bank Account for compensation payment	UE/District LARC/DPs
25	Delivery of compensation	District LARC
26	Establishment of Grievance Redress Committee	UE/District LARC
27	Construction of housing	DPs
28	Relocation	DPs
29	**MONITORING (internal monitoring)**	
30	Monitoring	UE
31	Preparation of compliance report	UE
32	Review of compliance report and issuance of no-objection for civil works	UE
33	**MONITORING (external monitoring)**	
34	Employment of external monitoring agency	UE/Consultant
35	EMA mobilization/Action plan preparation	EMA
36	Monitoring	EMA
37	Advicing project management regarding possible improvements in the implementation of the RP	EMA
38	**RELOCATION of EXISTING TRANSMISSION LINE**	**to be confirmed**
39	**CONSTRUCTION PERIOD**	**to be confirmed**

Figure 4: Schedule for Implementation monitoring and reporting

XIV. MONITORING AND REPORTING

166. This section describes the mechanisms and benchmarks appropriate to the project for monitoring and evaluating the implementation of the resettlement plan. It specifies arrangements for participation of affected persons in the monitoring process. This section will also describe reporting procedures.

167. The primary objective of monitoring is to identify as early as possible the activities achieved and the cause(s) of constraints so that the arrangements in the LARAP implementation can be adjusted. Monitoring is important because LARAP implementation is often the critical path for any project where civil works is involved, due to issues on land acquisition, compensation and resettlement that may cause delay in civil works. The early identification of the causes of delay will enable the UE (with support from the supervision consultants), to prepare the mitigating measures during LARAP implementation.

168. LAR tasks will be monitored internally. Internal monitoring (IM) will be carried out by the PIU in conjunction with District Hokimiyat.

XIV.1. Internal Monitoring

169. All activities in LAR are time bounded. Internal monitoring (IM) will be carried out by the PIU and the LARC in the District Hokimiyat. Process indicators will relate to implementation outputs and deliverables. These will be collected directly from the field, and will be reported monthly to the PIU to assess the LARAP implementation progress and adjust the work plan if necessary. These reports will be quarterly consolidated and submitted to JICA.

170. Specific IM benchmarks will be:

- Information campaign and consultation with APs.
- Status of land acquisition and payments on land compensation.
- Compensation for affected structures and other assets.
- Relocation of APs.
- Payments for loss of income.
- Selection and distribution of replacement land areas.
- Income restoration activities.
- Ensure the gender mitigation measures are adhered to during the internal monitoring and reporting process.

171. Upon the completion of resettlement, the PIU will prepare a post-LARAP implementation evaluation report that will assess both the permanent and temporary land acquisition activities and impacts of the Project focusing on the restoration of impacted lands and conditions of DPs especially those who were identified as vulnerable.

172. In addition, the PIU will update the LARAP and particularly the JICA's policy matrix, with a view to aligning Uzbekistan's CSS and reducing LARAP reporting requirements. Internal monitoring and reporting will continue for two years since the all affected households finish relocating to the new place.

XIV.2. External Monitoring Agency (EMA)

173. The External Monitoring Agency (EMA) should be selected by PIU and approved by JICA. It is responsible for:

- Monitoring of the activities of District Grievance Redress Committee.
- Monitoring of the activities of District SUELICS.
- Monitoring of the activities of Supervision Consultants.
- Monthly reporting to JICA regarding to the resettlement process and activities of all institutions involved to the resettlement process.

XV. ANNEX

XV.1. Annex 1. JICA's and Uzbekistan's Resettlement Policies

174. This Annex describes the main principles of JICA's Resettlement Policy, relevant laws and Governmental documents of the Republic of Uzbekistan, and the detailed comparison between these packages of documents.

JICA's Resettlement Policy[10]

Objectives

175. The objectives of the Resettlement Policy are:

- Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.
- Where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.
- Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

Impacts Covered

176. This policy covers direct economic and social impacts that both result from JICA-assisted investment projects, and are caused by

- the involuntary taking of land resulting in
  - relocation or loss of shelter;
  - loss of assets or access to assets; or
  - loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or
- the involuntary restriction of access to legally designated parks and protected areas resulting in adverse impacts on the livelihoods of the displaced persons.

177. This policy applies to all components of the project that result in involuntary resettlement, regardless of the source of financing.

178. Requests for guidance on the application and scope of this policy should be addressed to the Resettlement Committee.

Required Measures

179. To address the impacts the borrower prepares a resettlement plan that covers the following:

[10] This Section is based on the JICA's Guidelines for Environmental and Social Considerations and the World Bank Operational Policy – OP 4.01, Annex B. – See:http://www.jica.go.jp/english/our_work/social_environmental/guideline/pdf/guideline100326.pdf and http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0,,contentMDK:20064610~menuPK:64701637~pagePK:64709096~piPK:64709108~theSitePK:502184,00.html

- The resettlement plan includes measures to ensure that the displaced persons are
  - informed about their options and rights pertaining to resettlement;
  - consulted on, offered choices among, and provided with technically and economically feasible resettlement alternatives; and
  - provided prompt and effective compensation at full replacement cost for losses of assets attributable directly to the project.
- If the impacts include physical relocation, the resettlement plan includes measures to ensure that the displaced persons are
  - provided assistance (such as moving allowances) during relocation; and
  - provided with residential housing, or housing sites, or, as required, agricultural sites for which a combination of productive potential, location advantages, and other factors is at least equivalent to the advantages of the old site.
- Where necessary to achieve the objectives of the policy, the resettlement plan or resettlement policy framework also include measures to ensure that displaced persons are
  - offered support after displacement, for a transition period, based on a reasonable estimate of the time likely to be needed to restore their livelihood and standards of living; and
  - provided with development assistance in addition to compensation measure such as land preparation, credit facilities, training, or job opportunities.

180. The process framework also includes a description of the arrangements for implementing and monitoring the process.

181. To achieve the objectives of this policy, particular attention is paid to the needs of vulnerable groups among those displaced, especially those below the poverty line, the landless, the elderly, women and children, indigenous peoples, ethnic minorities, or other displaced persons who may not be protected through national land compensation legislation.

182. The implementation of resettlement activities is linked to the implementation of the investment component of the project to ensure that displacement or restriction of access does not occur before necessary measures for resettlement are in place. It means that these measures include provision of compensation and of other assistance required for relocation, prior to displacement, and preparation and provision of resettlement sites with adequate facilities, where required, also to assist the displaced persons are implemented in accordance with the plan of action as part of the project.

183. Payment of cash compensation for lost assets may be appropriate where livelihoods are not land-based. Cash compensation levels should be sufficient to replace the lost land and other assets at full replacement cost in local markets.

184. This JICA's policy also requires the following:

- Displaced persons and their communities, and any host communities receiving them, are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement. Appropriate and accessible grievance mechanisms are established for these groups.
- In new resettlement sites or host communities, infrastructure and public services are provided as necessary to improve, restore, or maintain accessibility and levels of service for the displaced persons and host communities. Alternative or similar resources are provided to compensate for the loss of access to community resources (such as fishing areas, grazing areas, fuel, or fodder).
- Patterns of community organization appropriate to the new circumstances are based on choices made by the displaced persons. To the extent possible, the existing social and cultural institutions of resettlers and any host communities are preserved and resettlers' preferences with respect to relocating in preexisting communities and groups are honored.

Eligibility for Benefits

185. Upon identification of the need for involuntary resettlement in a project, the borrower carries out a census to identify the persons who will be affected by the project, to determine who will be eligible to assistance, and to discourage inflow of people ineligible for assistance. The borrower also develops a procedure, satisfactory to the JICA, for establishing the criteria by which displaced persons will be deemed eligible for compensation and other resettlement assistance. The procedure includes provisions for meaningful consultations with affected persons and communities, local authorities, and, as appropriate, nongovernmental organizations (NGOs), and it specifies grievance mechanisms.

186. *Criteria for Eligibility.* Displaced persons may be classified in one of the following three groups:

- those who have formal legal rights to land (including customary and traditional rights recognized under the laws of the country);
- those who do not have formal legal rights to land at the time the census begins but have a claim to such land or assets--provided that such claims are recognized under the laws of the country or become recognized through a process identified in the resettlement plan; and
- those who have no recognizable legal right or claim to the land they are occupying.

Resettlement Planning, Implementation, and Monitoring

187. The borrower is responsible for preparing, implementing, and monitoring a resettlement plan, a resettlement policy framework, or a process framework (the "resettlement instruments"), as appropriate, that conform to this policy. The resettlement instrument presents a strategy for achieving the objectives of the policy and covers all aspects of the proposed resettlement. Borrower commitment to, and capacity for, undertaking successful resettlement is a key determinant of Bank involvement in a project.

188. The full costs of resettlement activities necessary to achieve the objectives of the project are included in the total costs of the project. The costs of resettlement, like the costs of other project activities, are treated as a charge against the economic benefits of the project; and any net benefits to resettlers (as compared to the "without-project" circumstances) are added to the benefits stream of the project.

189. The borrower is responsible for adequate monitoring and evaluation of the activities set forth in the resettlement instrument. The JICA regularly supervises resettlement implementation to determine compliance with the resettlement instrument. Upon completion of the project, the borrower undertakes an assessment to determine whether the objectives of the resettlement instrument have been achieved. The assessment takes into account the baseline conditions and the results of resettlement monitoring. If the assessment reveals that these objectives may not be realized, the borrower should propose follow-up measures that may serve as the basis for continued JICA supervision, as JICA deems appropriate.

Uzbekistan's Relevant Legal Instruments

Land Code of the Republic of Uzbekistan

190. This Code is approved by the Statute of Uzbekistan No. 598-I of April 30, 1998. Amended according to Division XIX of the Statute of Uzbekistan of August 30, 2003, item 41 of the Statute of Uzbekistan of December 3, 2004.

Article 16. Property for land in the Republic of Uzbekistan

191. Land is a state property, national wealth, is subject to rational use, protected by the state and is not subject to purchase and sale, barter, gift, pledge, with the exception of cases established by legal acts of the Republic of Uzbekistan.

Article 17. Rights of legal and physical persons for land parcels

192. The legal persons may have land parcels for the right of permanent possession, permanent use, and urgent (short time) use, lease and ownership in accordance with the present Code and other acts of legislation.

193. The legal persons may have land parcels for the right of lifetime inheritable possession, permanent use, urgent (short time) use, lease and ownership in accordance with the present Code and other acts of legislation.

Article 23. Granting (realization) of land parcels for possession and use

194. Granting (realization) of land parcels into possession, use, lease and ownership shall be made by the procedure of allotment.

195. The allotment of land parcels shall be made by the Cabinet Ministers of the Republic of Uzbekistan, khokims of oblasts, Tashkent city, areas, and cities by the procedure established by legislation.

196. Granting (realization) of a land parcel being into possession, use, lease and ownership shall be made only after bite (redemption) of the present land parcel by the procedure established.

197. Lands of non-agricultural designation or non-suitable for agriculture or agricultural lands of worse quality shall be granted (realized) for building of industrial enterprises, railway and motor roads, lines of communication and power lines, trunk pipelines, and also for other non-agricultural needs. Granting (realization) of land parcels from areas of the forest fund for indicated purposes shall be conducted mainly at the expenses non-covered areas by a forest or areas occupied by bushes and not valuable plants. It is prohibited to start possessing and using of a land parcel granting (realized) before establishment of respective boundaries of this land parcel in nature (on an area) by land surveying services and issue of documents certifying the right for a land parcel.

198. The procedure on granting (realization) of land parcels for possession, use, lease and ownership shall be established by legislation.

Article 35. State registration of rights on land parcels

199. Rights of legal and physical persons for land parcels are the subject of state registration.

200. The state registration of rights on land parcels shall be conducted at a place of location of land parcels. The following is included into the public register:

- information about a person who has received the right for a land parcel;
- description of a land parcel (a type of areas, a purpose of use, types of grounds, squares, share of joint possession or use, boundaries, cadastre number and other characteristics);
- information about conditions of the contract on granting of a land parcel, burdening and servitudes;
- decisions of empowered bodies on including of a land parcel in an area of alienation for state and public needs;
- other information established by legislation.

201. The official registration of rights of legal and physical persons for land parcels shall be conducted by corresponding empowered body within ten time period from the day of receipt of application with enclosure of necessary documents on rights for land parcels, with the exception of cases provided by legislation.

202. The grounds for refusal in state registration of rights for a land parcel are the following:

- presence of documents certifying on presence of a dispute about belonging of present land parcel in a body of state registration;
- presence of information about withdrawal of the present land parcel in a body of state registration established by legal procedure.

203. The grounds for refusal in state registration of rights for a land parcel are the following:

- absence of necessary documents on the right for a land parcel;
- absence of information provided by Part 3 of the present;
- changes of based purposed designation of a land parcel with violation of rules established;
- violation of established norms of a common square of a land parcel in the result of a transaction;
- presence in a body of the state registration of documents certifying about presence of a dispute on belonging to the present land parcel;
- presence in a body of the state registration of decision of a court on confiscation of objects of trade and services sector, dwelling houses, other buildings and constructions;
- absence of documents on payment of registration tax unless otherwise provided by legislation;
- decision on withdrawal of land parcels for state and public needs accepted by the established procedure.

204. The procedure of state registration of rights for land parcels shall be established by legislation.

Article 37. Withdrawal, buy-out of a land parcel for state and public needs

205. Withdrawal of a land parcel or its part for state and public needs shall be made with the consent of a landowner or with agreement with a land user and a farmer by decision accordingly of a khokim of an area, a city, an oblast or by decision of the Cabinet Ministers of the Republic of Uzbekistan.

206. In case of disagreement of a landowner, land user and farmer with a decision accordingly of a khokim of an area, a city, an oblast or a decision of the Cabinet Ministers of the Republic of Uzbekistan on taking off a land parcel, this decision may be appealed against in a court.

207. Enterprises, institutions and organizations which are interested in taking off a land parcels for building of enterprises, buildings, constructions shall be liable before the beginning of designing previously to come to an agreement with landowners, land users and farmers and also accordingly with a khokim of an area, a city, an oblast or the Cabinet Ministers of the Republic of Uzbekistan about a place of an object, a model size of a land parcel and conditions of its allotment taking into consideration of integrated development of an area. Financing of design works up to indicated preliminary agreement shall not be admitted.

208. Withdrawal of a land parcel for state and public needs and preliminary coordination of a place of location of an object and also registration of allotment of lands shall be made by a procedure established by legislation.

209. Buyout of a land parcel which is in ownership of legal and physical persons including of foreign persons together with an object of trade and services sector or living quarters and other building or a part of building for state and public needs shall be made by a decision of a khokim of an area, a city, an oblast or a decision of the Cabinet Ministers of the Republic of Uzbekistan with provision of guarantees provided by Article 41 of the present Code.

Article 41. Guarantee of rights for land parcels

210. Interference in the activity of landowners, land users, farmers and owners of land parcels from the direction of state, economic and other bodies, and organizations or also their public officers shall be prohibited, with the exception of cases provided by legislation.

211. Violated rights of landowners, land users, farmers and owners of land parcels are the subject to compensation by the procedure provided by legislation.

212. Losses caused by violation of rights of landowners, land users, farmers and owners of land parcels (including in lost profit) are the subject to compensation in full amount.

213. The taking of land parcels given to physical persons for state or municipal needs may be made after giving an equal land parcel by their wishes by a decision of a khokim of an area, a city, an oblast, building of living, industrial and other structures at a new place by enterprises, institutions and organizations for which a land parcel is allotted, in exchange for parcel taken and compensation all other losses in full amount (including in lost profit) according to Article 86 of the present Code.

214. The taking of lands of agricultural and forestry enterprises, agricultural research-and-development institutions, experimental and educational units for state or municipal needs may be made under the condition of building by their request living, manufacturing and other buildings in exchange for parcel taken off and compensation in full amount of all other losses (including of lost profit) according to Article 86 of the present Code.

215. Buyout of an object of trade and services sector or also living quarters and other buildings or a part of a building together with a land parcel on which they are located, being in ownership of legal and physical persons for state and municipal needs and also their confiscation shall be made by a procedure established by legislation.

Article 80. Ecological requirements to disposition, designing, construction and operation of objects, structures and constructions

216. The ecological requirements to disposition, designing, construction and operation of objects, structures and constructions shall be established by legislation on preservation of the environment.

217. The events on protection of lands shall be provided and shall be conducted which are negatively influencing on a condition of the grounds in case of disposition, designing, construction and putting into operation of new and reconstructed objects, structures and constructions, and also introduction of the new technologies.

218. Negative influence evaluation of input object or introducing technology on a condition of the grounds and efficiency stipulated by events on use and protection of the lands shall be conducted on the basis of ecological examination.

219. Putting into operation of objects and using of technologies which are not provided by measures of protection of lands from degradation or violation and the positive conclusion of ecological examination shall be prohibited.

220. Disposition of the objects influencing on a condition of the lands shall be agreed with land surviving, nature protection and others bodies by the procedure determined by legislation.

Article 86. Compensation of losses to land owners, land users, farmers and owners of land parcels

221. The losses caused to land owners, land users, farmers and owners of land parcels are the subject to compensation in full (including the missed benefit) in the following cases:

- withdrawal, buy out or temporary withdrawal of lands;
- restriction of their rights in connection with establishment of water protection zones, zones of sanitary protection of water objects, zones of formation of surface and underground waters, zones of resort natural territories, zones of state biosphere reserves, protective zones around state

preserves, reserves, state monuments of nature, objects of material cultural heritage, disposals, roads, pipelines, communication lines, power lines; (Paragraph 3 is stated in edition of point 9) of Article 9 of the Law of the RUz No. ZRU-278 dated 04.01.2011);

- deterioration of the lands as a result of the influence caused by construction and operation of reservoirs, channels, collectors and other objects allocating harmful substance for agricultural crops and plantings and other actions of legal and physical persons leading to reduction in a crop and deterioration agricultural production.

222. The compensation of losses shall be made by enterprises, institutions and organizations for which the withdrawn land parcels are allocated and also enterprises, institutions and organizations which activity attracts restriction of the rights of land owners, land users, farmers and owners of the land parcels or deterioration of nearby grounds by the procedure established by legislation.

Article 91. Return of unauthorized occupied lands

223. The land parcels occupied without permission shall be returned on their belonging without compensation of the expenses made in time of illegal possession and using.

224. Restoring to serviceability of the land parcels for use of condition including of housebreaking shall be made at the expense of persons who have occupied these land parcels without permission.

225. Returning of a land parcel occupied without permission to a land owner, land user, farmer or to an owner of the land parcel shall be made under a decision a khokim of a respective area, city, and region or under a decision of a court.

Civil Code of the Republic of Uzbekistan

226. This Code is enacted by Oliy Majlis of Uzbekistan No. 257-I of August 29, 1996. Amended according to different laws of Uzbekistan of 1996-2012.

Article 187. Acquisitive prescription

227. A person who is not the owner of property but who has in good faith, openly, and uninterruptedly possessed as his own immovable property for fifteen years or other property for five years, shall acquire ownership of this property (acquisitive prescription).

228. The right of ownership of an immovable and of other property subject to state registration shall arise for a person who has acquired this property by virtue of acquisitive prescription from the time of such registration.

229. Until the acquiring of the right of ownership to the property by virtue of acquisitive prescription, a person possessing property as his own has the right to protection of his possession against third persons who are neither owners of the property nor have the right of possession by virtue of another basis provided by a Law or the contract.

230. A person relying on prescription by possession may join to the time of such possession all the time during which the property was possessed by the one to whom this person is a legal successor.

231. The running of the period of acquisitive prescription with respect to things located with a person from whose possession they could be taken in accordance with Articles 228, 229, 230 and 232 of the present Code starts not sooner than the expiration of the period of limitation of actions for the respective claims.

Article 199. Taking of property from an owner

232. The taking of property from an owner shall be allowed only by the levying of execution on its property for obligations of the owner in cases and by the procedure provided by legislative acts, and also by the procedure of nationalization, requisition and confiscation.

233. If property has come into ownership by a person to whom by virtue of a Law the property may not belong to him, the right of ownership for this property shall be terminated by the procedure of a court with compensation the value of taking of property to the person.

Article 206. Termination of the right of ownership not directed for taking of property from an owner

234. Termination of the right of ownership in connection with a decision of state body non- directed to the taking of property from an owner including with a decision on the taking of land parcel on which there are a house of the owner, other buildings, structures or plantations, shall be allowed only in cases and by the procedure established by legislative acts with provision to the owner equal property and compensation to him in full of value of losses caused by termination of the right of ownership

235. In case of disagreement of an owner with a decision entailing termination of the right of ownership, it may not be made before the rendering of a decision in the dispute by a court. All problems on compensation to an owner losses caused shall also be solved under consideration of dispute.

Article 212. Unauthorized building

236. An unauthorized building is a dwelling house, other structure, construction, or other immovable property made on a land parcel not allocated for these purposes by the procedure established by legislation and also made without receipt of the necessary permissions thereto or with substantial violation of architectural and construction norms and rules

237. A person who has made an unauthorized building does not acquire the right of ownership to it. He does not have the right to dispose of the building, to sell, give, lease out, or make other transactions.

238. An unauthorized building by a suit of a person whose rights have been violated or the respective state body must be torn down by a decision of a court by the person who made it or at this person's expense except for cases provided by Paragraph 4 and 5 of the present Article.

239. The right of ownership to an unauthorized building may be recognized by a court for the person who made the building on a land parcel not belonging to him on the condition that the given parcel shall be granted to this person by the established procedure for the building that was made. (Amended by item 1 of Section IX of the Law of RU No. 671-II of August 27, 2004.).

240. The right of ownership to an unauthorized building may be recognized by a court for the person in whose ownership, lifetime inheritable possession, and permanent use is the land parcel where the building was made. In this case the person for whom the right of ownership to the building is recognized shall compensate the person who made it for the building expenses in an amount determined by the court.

241. The right of ownership to an unauthorized building may be recognized for these persons if the keeping of the building violates the rights and interests protected by a Law of other persons or creates a threat to the life and health of citizens.

Directions on the procedure for official registration of the rights to land plots in the Republic of Uzbekistan

242. These Directions are registered by Ministry of Justice of the Republic of Uzbekistan No. 736 of May 27, 1999.

Article 4.Procedure for official registration of the rights to land plots

243. Documents required for registration, which serve to establish the emergence of the rights to land plots, as well as their discontinuation, transfer and introduction of burdens and changes, should be notarised in cases expressly stated in the law.

244. Properly notarized documents relating to operations in land plots are not subject to any additional verification when undergoing the registration procedure.

245. The rights to land plots are registered on the basis of the following documents:

- when there emerges the right of ownership of the land plot – on the basis of the official warrant to the right of ownership, purchase-and-sale contracts and other documents specified under the law;
- when there emerges the right of possession and use of the land plot – on the basis of a decision to allocate a land plot taken by an appropriate authority (an official);
- when there emerges the right of lease – on the basis of a decision to grant a land plot on lease and a lease contract;
- when transferring the right of possession or use of the land plot – on the basis of the contract for the purchase and sale, change, granting or rent: a certificate of the right of inheritance of buildings and structures or an appropriate decision taken by the land plot's owner or a body (an official) authorized by the latter to do so;
- when there are servitudes – on the basis of an appropriate contract or court adjudgement;
- when there are burdens – on the basis of decisions taken by appropriate authorities.

246. Registration of the rights to land plots is carried out in the following succession:

- reception of the application;
- verification of the application and documents and materials enclosed;
- registration of the application in a special application registry;
- registration of the rights to the land plot;
- provision of the subject of the right with a certificate of registration of its rights to the land plot.

247. Registration of the rights to land plots is accomplished within 10 days from the date the registration authority has accepted the application for consideration.

248. In cases where (i) the documents submitted fail to meet the established criteria, with a defect seeming to be so insignificant that it could be eliminated at once, (ii) any additional information is required, or (iii) the documents submitted have to be examined, the registration authority may put off the final decision for two weeks from the date a decision on adjournment is taken. If the applicant fails to put his documents in order within this period, his application for registration may be rejected, with the former being informed of the fact in writing. Registration fees are not refundable.

249. Registration is valid from the date when the documents required for registration have been submitted. This should be reflected in a registry. The right's priority is established on the basis of the date the application has been entered on the registry.

250. The registration procedure having been finalized, the registration authority certifies the fact either by issuing a certificate of the registered right or by marking the document submitted for registration with an appropriate notice.

Cabinet of Ministers Resolution on "Order of compensation of citizens' and legal entities' losses due to land plots acquisition for state and public needs"

251. This Resolution No. 97 is adopted of May 29, 2006. Amended according to Resolutions of CM No. 248 of November 9, 2010 and No. 146 of May 25, 2011.

Point 2

252. Land or it's part is resumed for the state and public needs only by the consent of or agreement with the land owner, tenant by the decision of district or city mayor, Council of Ministers of the Republic of Karakalpakistan, regional mayor offices and Cabinet of Ministers of the Republic of Uzbekistan and Tashkent city mayor.

Point 6

253. Illegally constructed houses, buildings and structures are not subject to compensation.

Point 7

254. In case of land allotment of the resumed land to enterprises, organizations and entities the payment of compensation, provision of houses (flats) and provision of temporary houses as well as full coverage of relocation costs are done by these entities, organizations and enterprises.

Point 9

255. District mayor office creates commission which defines the amount and type of compensation for demolished houses (flats), buildings, structures and plantations. The commission is headed by the district deputy mayor and consists of the following members: representative of financial and other departments of the mayor office, state inspector on monitoring over land usage and protection, representatives of makhalla committees, land owner (land user, tenant) whose land is resumed, representatives of the entities, organizations and enterprises whom the land plot is allotted and other representatives at mayor offices discretion.

Point 10

256. Technical status valuation of houses, buildings and structures and definition of plantations value on the resumed land is done by the district department on land resources and state cadastre at the expense of applicant. At landowners discontent with cadastre's valuations he/she can apply to independent licensed valuers. The independent valuer's service payment is done by the applicant.

Point 12

257. All construction materials left after demolishing of houses, buildings and structures (except unauthorized ones) on the resumed land plot will go to constructor or landowner paying full compensation for the owner.
In separate cases the construction materials can be given to the owner of the demolished houses, buildings and structures at his/her will and by the decision of relevant district (city) mayor. In this case the commission must define the value of the construction materials at market prices taking into consideration depreciation.

Point 13

258. Exact dates and order of compensation payment is defined by the decision of the Council of Ministers of the Republic of Karakalpakstan, regional and Tashkent city mayors with payment of compensation prior to demolishing.

XV.2. Annex 2. Pictures at Resettlement Area

Picture 1. Mkhalla "Yangiobod" (overall view)

Picture 2. The courtyard of Azamat Salimov's household in Makhalla "Uyrot" (view on the Navoi Thermal Power Plant)

Picture 3. Unfinished houses in Makhalla "Yangiobod" (overall view)

Picture 4. Well-to-do households in Makhalla "Uyrot"

Picture 5. The census (Makhalla “Uyrot”)

Picture 6. The field with clover and corn (Makhalla “Yangiobod”)

XV.3. Annex 3. Meeting Minutes and the list of participants on the meeting of 30 October 2012

Meeting of residents and representatives of JICA and TEPSCO

October 30, 2012 (09.20-11.20)

PROTOCOL

Place of meeting: Recreation Room in Navoi CCCGP No.1's camp site

Method of notification to residential people: informing neighboring residents through their representatives

1. Opening remarks, the project description - Ganiev K. Director of Navoi TPP (09.20).

2. Presentation of the project - Norihiko Fukazawa, Yoko Hamada (09.40).

3. Speech by Governor of Karmana district - Ismatov R. (10.45).

4. Questions and answers. Discussion with residents to be resettled. (11.00).

The first speech (Saifi Obloberdyev, pensioner from makhalla "Uyrot").

Supports modernization of Navoi TPP because it will give new energy to the development of the economy of Navoi region and the country as a whole. (Applause)

Project Owner: We appreciate your support.

The second speech (representative of the residents, did not introduce him/herself.)

Residents have no objection to the new project. Expressed dissatisfaction with the fact that the evaluation of their homes was made with earlier date of construction, which makes the value of their homes lower than it should be.

Other residents, attending the meeting, supported him. Governor Ismatov reassured (calming down the speaker): "The problem can be solved."

Next, Governor Ismatov said that compensation money for resettled residents can be paid "even today". But then, the residents will have to relocate in the cold season. So he proposed them to begin construction on new allocated sites today at their own expense. Compensation money will be paid in spring, so that they could start construction the main building.

Residents: We prefer to get monetary compensation by cash rather than by bank remittance.

Project owner: According to the law, we cannot provide monetary compensation by cash.

5. End of meeting. Residents and representatives of JICA, TEPSCO and local authorities break up.

THE MEETING WITH RESETTLED RESIDENTS AND OFFICIALS

(30 October 2012, 09.20-11.45, Navoi TPS)

No.	Name	Gender	Status
1	KuvondikBerdiev	male	Resettled resident
2	KorholBerdieva	female	Resettled resident
3	ShakhloKosimova	female	Resettled resident
4	SevdiyorBerdiev	male	Resettled resident
5	MukaddasBerdieva	female	Resettled resident
6	AlisherNurmatov	male	Resettled resident
7	ShakhloAshurova	female	Resettled resident
8	TuimurodRamazanov	male	Resettled resident
9	SevdiyorAshurov	male	Resettled resident
10	HusniddinAkhmedov	male	Resettled resident
11	ShafzodToshev	male	Resettled resident
12	IskandarHamroev	male	Resettled resident
13	IkhtiyorBerdiev	male	Resettled resident
14	ShukhratObloberdiev	male	Resettled resident
15	HudaiberdiObloberdiev	male	Resettled resident
16	UmidObloberdiev	male	Resettled resident
17	Aziz Berdiev	male	Resettled resident
18	KobilKayumov	male	Resettled resident
19	RaimObloev	male	Resettled resident
20	RustamShamsiev	male	Resettled resident
21	ShoiraObloberdieva	female	Resettled resident
22	SanobarKlycheva	female	Resettled resident
23	KomilSamatov	male	Resettled resident
24	AbrorHokimov	male	Resettled resident
25	SunnatErgashev	male	Resettled resident
26	RavshanTuraev	male	Resettled resident
27	IkhtiyorKamolov	male	Resettled resident
28	SirodjHodjiev	male	Resettled resident
29	MuborakHodjieva	female	Resettled resident
30	MuborakNosirova	female	Resettled resident
31	KadriyaIslomova	female	Resettled resident
32	GulomMamatov	male	Resettled resident
33	NurulloErgashev	male	Resettled resident
34	KobilInoyatov	male	Resettled resident
35	KakhramonGaniev	male	Navoi TPS, Director
36	NajmiddinBabakandov	male	Navoi TPS, Deputy Director
37	IbrokhimNorov	male	Navoi TPS, Assistant Director
38	MuzaffarYarashov	male	Navoi TPS, Chairman of a union

39	ShukhratDostov	male	Navoi TPS, Member of PIU (Project Implementation Unit)
40	UtkirHamraev	male	Photographer
No.	**Name**	**Gender**	**Status**
41	IstamHamraev	male	Navoi TPS, Chief of information
42	NazokatSafarova	female	Navoi TPS, Secretary
43	YulduzAdylova	female	Navoi TPS, Member of PIU (Project Implementation Unit)
44	SharofiddinIsmatov	male	Navoi Region, Karmana District, Hokim (Major)
45	KomilSamatov	male	Karmana District, Makhalla “Yangiobod”, Posbon (Commissary)
46	KobilInoyatov	male	Karmana District, Rural Citizen Assembly “Yangiobod”, Chairman
47	NurulloErgashev	male	Karmana District, Makhalla “Uirot”, Chairman
48	GulomMamatov	male	Karmana District, Makhalla “Yangiobod”, Chairman
49	MuborakNosirova	female	Karmana District, Makhalla “Yangiobod”, Female Issues Consultant
50	KadriyaIslomova	female	Karmana District, Makhalla “Yangiobod”, Secretary
51	AlisherNumatov	male	Karmana District, Chief of Land and Assets Cadaster
52	Hakim Akhmedov	male	Karmana District, Deputy Chief of Architecture and Construction Department

XV.4. Annex 4. Resolution of the Karmana District Hokim No. 605-K

Resolution of the Khokim (Governor) of the Karmana District of the Navoi Region Republic of Uzbekistan Karmana district, Yangi-Aryk Village Citzens' Gathering, Talkok Makhalla Citizens' Gathering

Date: 11 July 2012

Ref. No. 605-K

On approving the membership of the Special Commission on seizure of the housing land plots owned by the natural persons with their consent for the public needs

For the purpose of ensuring the execution of the Decree of the President of the Republic of Uzbekistan No. UP-1668 dated December 27th 2011 and in accordance with the Article 41 of the Land Code of the Republic of Uzbekistan in order to ensure conducting inventory of the housing of the citizens to be demolished and provision of the housing for the re-settled families and paying the compensation for the citizen, which house shall be demolished in connection with the new construction of the road section with the length of 3.4 km, located between the 159.4 km of the Road M-37 to the intersection of the streets Nizomiy and Navoi of the Navoi city as well as with the construction of the Second 450 MWt capacity Gas and Steam Combined Unit of the Navoi Thermal Power Plant

I HAVE RESOLVED AS FOLLOWS:

1. Approve the membership of the Special Commission in accordance with the Annexes 1 and 2, which will determine the amount of the compensation and type of compensation for the citizen, whose housing will be demolished in connection with the capital repair of the road section with the length of 3.4 km, located between the 159.4 km of the Road M-37 to the intersection of the streets Nizomiy and Navoi of the Navoi city where section for the enlargement of the road is located at the area of the YangiArik village gathering of citizen Makhallas Argun, Yangi Arik, Talkok as well as with the construction of the Second 450 MWt capacity Gas and Steam Combined Unit of the Navoi Thermal Power Plant located at the area of Uyrot village citizen gathering Makhallas Uyrot and Yangiobod.

2. Special Commission (headed by Sh. Ismatov) shall perform its activity on determining the amount of compensation and type of compensation for the citizen, whose housing shall be demolished in connection with the seizure of the land plots for the state and public needs, on the basis of the Resolution No. 97 of the Cabinet of Ministers of the Republic of Uzbekistan "On Approval of the Regulation On the Order of Compensation of the Loss, Inflicted to the Citizens and Legal Entities in Relation with the Seizure of the Lands for the State and Public Purposes" dated May 29th 2006 and Article 41 of the Land Code of the Republic of Uzbekistan. Special commission shall formalize in appropriate manner minutes on the progress of implemented works till 30 July of the current year.

3. Control over the execution of the present Resolution shall be assigned upon the Acting First Deputy of District Khokim (Governor) Mr. Sh. Ismatov.

District Khokim (Governor)Ch. Kanoatov

Annex 1 to the Resolution of the Karmana District Khokim (Governor) Ref. No. 605-K, dated July 11, 2012

MEMBERSHIP

of the Special Commission on

determining the amount of the compensation and type of compensation for the citizen, whose housing will be demolished due to the seizure of the land plots for state and public needs for the enlargement of the road in connection with the capital repair of the road section with the length of 3.4 km, located between the 159.4 km of the Road M-37 to the intersection of the streets Nizomiy and Navoi of the Navoi city.

Mr. Sh. Ismatov	First Deputy of District Khokim (Governor), Chairman of the Special Commission
Mr. V. Urinov	Director of Navoi AutoYul (Navoi branch of Road Agency)
Ms. M. Akhmedova	Head of the District Department of Finance
Mr.A. Nurmatov	Chief of State Unitary Enterprise District Land and Immovable Cadastre Service
Mr. Mukhammatkuov	Head of the District Architecture and Construction Department
Mr. A. Ernazarov	Director of the Branch of Karmana District Gas Agency
Mr. B. Islamov	Head of the District Electric Power networks
----------	Head of the Anti-Fire Department of Interior
Mr. R. Rajabov	Chief Doctor of the District State Sanitary Epidemiology Agency
Mr. I. Radjabov	Head of the District Nature Protection Department
Mr. B. Toshev	Acting Director of the Karmana Drinking water production Liability Limited Company
Mr. S. Kurbonov	Chairman of the District Makhalla Charity Public Foundation
Mr. I. Yodgorov	YangiArik Village Citizen’s Gathering
Mr. Kh. Jurayev	ArgunMakhalla Citizen’s Gathering
Mr. D. Akramov	YangiArikMakhalla Citizen’s Gathering
Mr. U. Kurbonov	TalkokMakhalla Citizen’s Gathering
----------	Citizen, whose housing is being demolished for the state and public needs

Chief Specialist

of the District Khokimiyat (Governor’s Office)

on the issues of capital construction, communications,

public utilities and municipal improvements

_____ Mr. F. Ismoilov

Annex 2 to the Resolution of the Karmana District Khokim (Governor) Ref. No. 605-K, dated July 11, 2012

MEMBERSHIP

of the Special Commission on

determining the amount of the compensation and type of compensation for the citizen, whose housing will be demolished due to the seizure of the land plots for state and public needs in connection with the construction of the Second 450 MWt capacity Gas and Steam Combined Unit of the Navoi Thermal Power Plant.

Mr. Sh. Ismatov	First Deputy of District Khokim (Governor), Chairman of the Special Commission
Mr. K. Ganiev	Director of the Open Joint Stock Company Navoi Thermal Power Plant
Ms. M. Akhmedova	Head of the District Department of Finance
Mr.A. Nurmatov	Chief of State Unitary Enterprise District Land and Immovable Cadastre Service
Mr. Mukhammatkuov	Head of the District Architecture and Construction Department
Mr. A. Ernazarov	Director of the Branch of Karmana District Gas Agency
Mr. B. Islamov	Head of the District Electric Power networks
----------	Head of the Anti-Fire Department of Interior
Mr. R. Rajabov	Chief Doctor of the District State Sanitary Epidemiology Agency
Mr. I. Radjabov	Head of the District Nature Protection Department
Mr. B. Toshev	Acting Director of the Karmana Drinking water production Liability Limited Company
Mr. S. Kurbonov	Chairman of the District Makhalla Charity Public Foundation
Mr. K. Inoyatov	Uyrot Village Citizen’s Gathering
Mr. N. Ergashev	Uyrot Makhalla Citizen’s Gathering
Mr. G. Mamatov	Yangiobod Makhalla Citizen’s Gathering
----------	Citizen, whose housing is being demolished for the state and public needs

Chief Specialist

of the District Khokimiyat (Governor’s Office) on the issues of capital construction, communications, public utilities and municipal improvements

_____ Mr. F. Ismoilov

XV.5. Annex 5. Resolution of the Karmana District Hokim No. 612-K

Resolution of the Khokim (Governor) of the Karmana District of the Navoi Region Republic of Uzbekistan Karmana district, Yangi-Aryk Village Citzens' Gathering, TalkokMakhalla Citizens' Gathering

Date: 12 July 2012

Ref. No. 612-K

On seizure of the housing land plots owned by the Natural persons with their consent for the public needs

For the purpose of ensuring the execution of the Decree of the President of the Republic of Uzbekistan No. UP-1668 dated December 27th 2011 and in accordance with the Article 41 of the Land Code of the Republic of Uzbekistan District Khokim (Governor) has issued Decree No. 605-K, dated July 11th, 2012 On Setting up Working Group, which shall perform activities on conducting inventory of the housing of the citizens to be demolished and provision of the land plots for the families to be re-settled in connection with the new construction of the road section with the length of 3.4 km, located between the 159.4 km of the Road M-37 to the intersection of the streets Nizomiy and Navoi of the Navoi city as well as with the construction of the Second 450 MWt capacity Gas and Steam Combined Unit of the Navoi Thermal Power Plant. After examining the Minutes of the Working Group

I HAVE RESOLVED AS FOLLOWS:

1. In accordance with the District Khokim (Governor) Decree No. 605-K, dated July 11th, 2012 the list of citizens, whose housing shall be demolished in relation with the new construction of the road section with the length of 3.4 km, located between the 159.4 km of the Road M-37 to the intersection of the streets Nizomiy and Navoi of the Navoi city, shall be confirmed in accordance with the Annexes 1 and 2.

2.District Department of the Land Resources and State Cadastre (Mr. Gaffarov A.) shall be assigned with the task of drafting and submission for the approval by the District Khokim (Governor) the proposals on allocation of the land plots, in the sizes, determined in the Article 41 of the Land Code of the Republic of Uzbekistan and Resolution No. 97 of the Cabinet of Ministers of the Republic of Uzbekistan "On Approval of the Regulation On the Order of Compensation of the Loss, Inflicted to the Citizens and Legal Entities in Relation with the Seizure of the Lands for the State and Public Purposes" dated May 29th 2006.

3. Chief Officials, responsible for the construction of the present road and 450 MWt capacity steam and gas combined unit shall carry out payment of the compensations, allocation of the lands and provision of the housing to the owners of the housing to be demolished due to the road construction in accordance with the requirements of the Resolution No. 97 of the Cabinet of Ministers of the Republic of Uzbekistan "On Approval of the Regulation On the Order of Compensation of the Loss, Inflicted to the Citizens and Legal Entities in Relation with the Seizure of the Lands for the State and Public Purposes" dated May 29th 2006, Land Code of the Republic of Uzbekistan, Citizen's Code of the Republic of Uzbekistan and Housing Code of the Republic of Uzbekistan.

4. Control over the execution of the present Resolution shall be assigned upon the Acting First Deputy of District Khokim (Governor) Mr. Sh. Ismatov and Deputy of District Khokim (Governor) Mr. Kh. Jurayev.

District Khokim (Governor)Ch.Kanoatov

Round Stamp

XV.6. Annex 6. Resolution of the Karmana District Hokim No.8/61 dated on August 14, 2006

O'zbekiston Respublikasi
Navoiy viloyati
Karmana tumani
Hokimi
QARORI

РЕШЕНИЕ
Хокима
Карманийского Района
Навоийской области
Республики
Узбекистан

№ 8/61 "14" АВГУСТА 2006 йил

Кармана туман «Уйрот» кишлок фукаролар йигини худудидан кишлокларни кенгайтириш учун колдирилган ерлардан фукароларга якка тартибда уй-жой куришлари учун ер ажратиш тугрисида

Кармана туман «Уйрот» кишлок фукаролар йигини-нинг 2006 йил 3 июлдаги 6/44-сонли карори хамда туман ер таксим комиссиясининг 2006 йил 25 июлдаги далолатномасини куриб чикиб

КАРОР КИЛАМАН:

Кармана туман хокимлиги хузуридаги ер таксим комиссиясининг 2006 йил 25 июлдаги далолатномаси ва «Уйрот» кишлок фукаролар йигинининг 2006 йил 3 июндаги 6/44-сонли карори тасдиклансин.

2. «Уйрот» кишлок фукаролар йигини худудидаги кишлокларни кенгайтириш учун колдирилган ерлардан фукароларга якка тартибда уй-жой куришлари учун 42,2 пафар оилаларга 9,73 гектар ва йул хамда кучалар куришлари учун 1,52 гектар, жами 11,25 гектар экин ери ажратиб берилсин.

3. Туман уй-жойлар куришлари мувофиклаштириш маркази бошлиги М.Курбоновга фукароларга ажратилган якка тартибдаги уй-жой хужжатларини расмийлаштириб бериш топширилсин.

4. Якка тартибда уй-жой куриш учун ер майдони ажратилган фукаролар зиммасига уй-жойлар куришлари мувофиклаштириш маркази бошлиги такдим этган лойиха хужжатлари асосида 2 йил муддат ичида куриш назифаси юклатилсин.

5. Ер ажратилган фукаролар рухсатсиз ерларга мувофик тасдиклансин.

6. Карорни бажарилишини назорат килиш туман хокимининг биринчи уринбосари Ш.Исмоилова зиммасига юклатилсин.

Кармана туман хокими Ч.Б.Капоатов

August 14, 2006

About assignment of lands to citizens for house building on an individual basis from the lands that were kept for enlargement of villages at the village community assembly «Uyrot» of Karmana District

After consideration of Decision No. 6/44 on June 3, 2006 awarded by the village community assembly «Uyrot» of Karmana District and the information of District Cadastre on July 25, 2006,

I HEREBY RESOLVE:

1. To confirm the information of District Cadastre on July 25, 2006 and the Decision No. 6/44 on June 3, 2006 awarded by the village community assembly «Uyrot» of Karmana District.

2. To set aside and provide the land plots of the size of 9.73 ha from the lands that were kept for enlargement of villages at the village community assembly «Uyrot» of Karmana District for 122 families on an individual basis, and и 1.4 ha for road construction, total of 11.25 ha of the cultivated area.

3. To lay under an obligation the District Coordination Center for House Building Head Mr. M. Kurbanov to give the perfect individual housing documentation.

4. The citizens who have received the lands for individual housing building must to build the housing during 2 years on the basis of construction documentation that will be provided by the District Coordination Center for House Building Head.

5. To confirm the list of citizens who have received the lands on the basis of the Annex.

6. To impose control for execution this Decision on the First Deputy Hokim Mr. Sh. Ismoilov.

Karmana District HokimMr. Ch. B. Kanoatov

XV.7. Annex 7. The list of resettled households with the names of household heads

No.	Household's No.	Name of Household Head
"Uyrot" makhalla		
1	Household No. 1	SevdiyerBerdiev
2	Household No. 2	HudoiberdiObloberdiev
3	Household No. 3	IkhtiyerBerdiev
4	Household No. 4	ShukhratObloberdiev
5	Household No. 5	GolibNarzillaev
6	Household No. 6	SaifiObloberdiev
7	Household No. 7	IskandarHamroev
8	Household No. 8	KamolYekubov
9	Household No. 9	Aziz Berdiev
10	Household No. 10	KuvondikBerdiev
11	Household No. 11	UmidObloderdiev
12	Household No. 12	KobilKayumov
"Yangiobod" makhalla		
13	Household No. 13	SevdiyerAshurov
14	Household No. 14	SherzodToshev
15	Household No. 15	ShakhloKosimova
16	Household No. 16	HusniddinAkhmedov
17	Household No. 17	Rashid Madatov
18	Household No. 18	TuymurodRamazanov
19	Household No. 19	AzamatSalimov
20	Household No. 20	KakhramonUlashov
21	Household No. 21	RustamShamsiev
22	Household No. 22	TulkinOchilov
23	Household No. 23	NigoraKodirova
24	Household No. 24	Aziz Kudratov
25	Household No. 25	OlimMustafoev
26	Household No. 26	SafiyaMamatova
27	Household No. 27	ShoiraJabborova
28	Household No. 28	DilmurodTilovov
29	Household No. 29	GulchehraMamatova
30	Household No. 30	MadinaPakhmatova
31	Household No. 31	MadinaMamatova
32	Household No. 32	HamzaEshkobilov
33	Household No. 33	Yusuf Jabborov

XV.8. Annex 8. The photos of the relocation places

Picture 7.The relocation land plot No. 1

Picture 8.The relocation land plot No. 2

Picture 9.The relocation land plot No. 2

Picture 10.The relocation land plot No. 2

XV.9. Annex 9. The valuation report (No. 327 of 28 September 2012) made by "Navoi Baxolashva Konsalting Markazi", LTD.

МАЪЛУМОТНОМА

«НАВОИЙ БАХОЛАШ ВА КОНСАЛТИНГ МАРКАЗИ» томонидан кучирилиши лозим булган уй-жойларни бахоланган бахоси ва бажарилган ишлар харажати, эгаларига хисоб ракамлари очиш руйхати

№	Мулк эгасининг Ф.И.Ш.	Ер майдони (м2)	Бинонинг курилиш ости майдони м2	Уй-жойни бахоланган бахоси (Сўм)	Бахолаш учун килинган харажат (Сўм)
1	Абдибердиев Шухрат	1 807	624.10	77108840	1083316
2	Хамроев Искандар	1 150	158.10	30951732	765154
3	Бердиев Сохибёр	1 032	401.91	53108486	1076281
4	Абдибердиев Умид	800	177.12	43734128	774166
5	Абдибердиева Шойира	800	385.38	72167425	1016588
6	Абдибердиев Сайфи	2 500	223.15	58632305	909820
7	Бердиев Азамат	1 130	167.75	27747053	761536
8	Бердиев Кувандик	1 066	227.19	29834280	862853
9	Байимов Кобил	1 702	348.12	63474135	1246313
10	Бердиев Ихтиёр	1 128	258.30	39012983	783243
11	Якубов Камол	1 969	110.86	75536259	1304199
12	Абдибердиев Худойберди	3 647	1 166.03	133212340	1604472
13	Асророва Мохигул	916	215.15	35860707	651195
14	Ахмедов Хусниддин	839	168.00	18388769	651195
15	Косимова Шахло	826	47.50	9680138	361778
16	Ражабова Туймурат	777	219.50	35609647	651195
17	Комилова Нигора	747	293.45	52578203	651195
18	Мадатов Рашид	750	104.30	14270058	651195
19	Салимов Ахмат	888	172.95	27858610	651195
20	Очилов Тулкин	605	188.30	36073673	651195
21	Тошев Шермат	1 640	161.90	18529188	747065
22	Ашуров Сохибёр	1 650	292.46	56501980	855598
23	Шамсиев Рустамжон	850	100.65	30139591	651195
Жами				1241487262	19353121

Пул жамгармасига номланиши. (Поступления для зачисления во вклад). Р/С 29801000900000703018 ИНН 200035608 МФО 00703

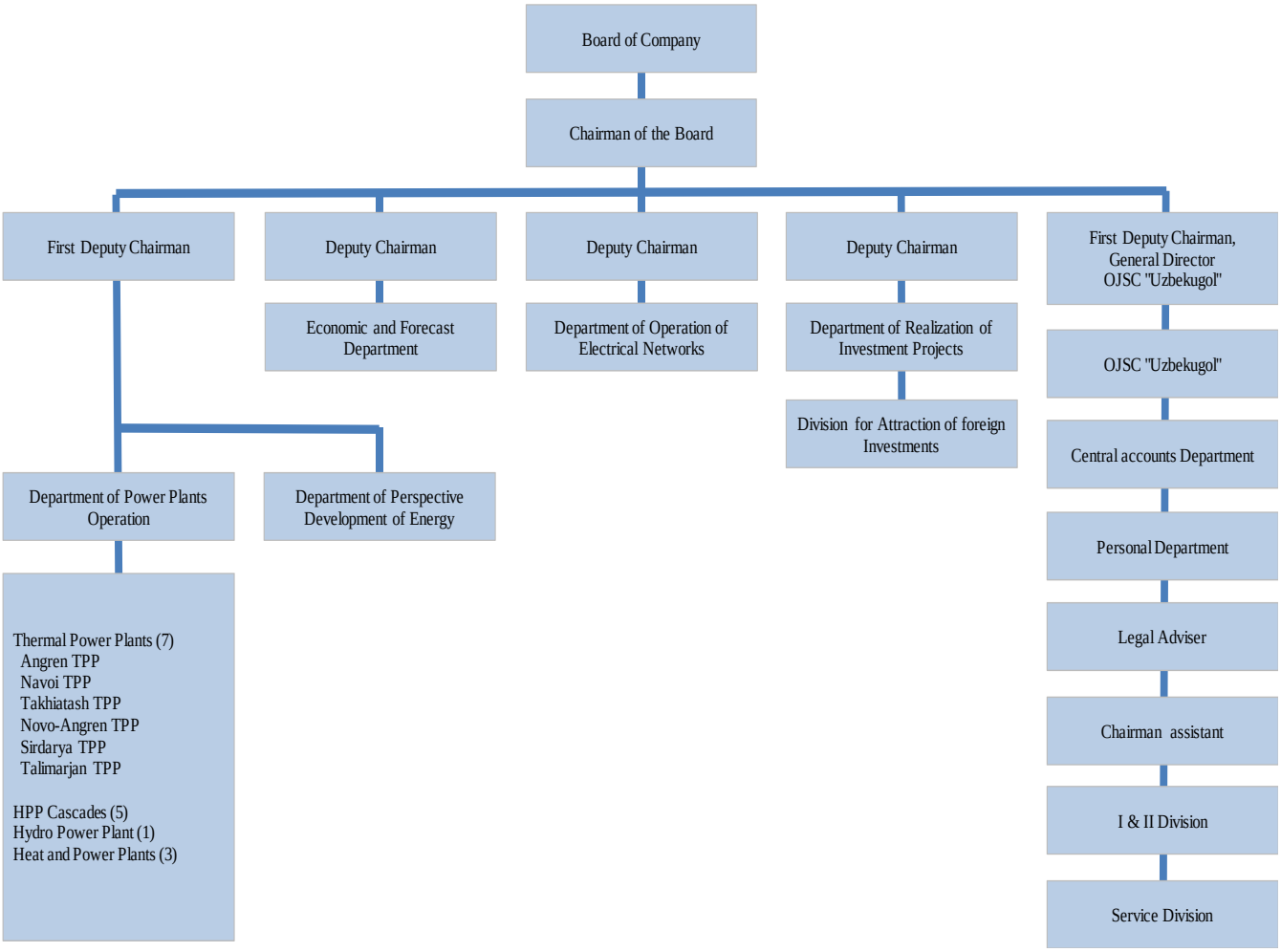
Карманa тумани «Халк банки»

Chapter 11 Proposal for implementation scheme and operation, maintenance and management system

11.1 Verification of the project implementation system, financial stability, technological capacities and others of the implementation body

11.1.1 Project implementation system

Figure 11.1.1-1 shows the organization chart of the SJSC Uzbekenergo. The organization is operated by Chairman and five Deputy Chairmen. The Navoi thermal power plant pertains to the Department of Power Plants Operation, and is placed under the jurisdiction of the first Deputy Chairman.

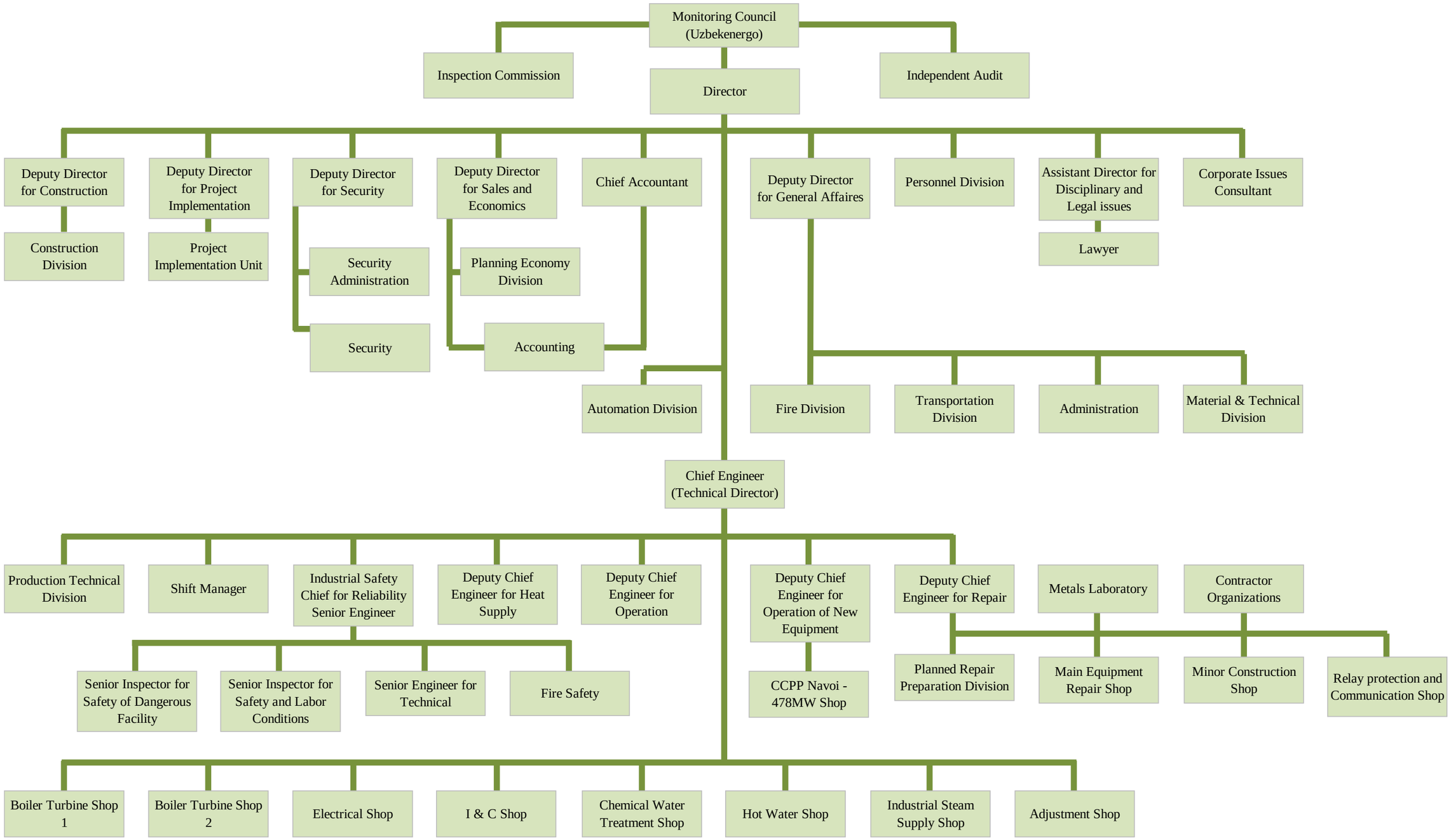


Source: SJSC Uzbekenergo

Figure 11.1.1-1 Organization Chart of SJSC “Uzbekenergo”

Figure 11.1.1-2 is an organization chart of the Navoi thermal power plant. The Navoi thermal power plant is staffed by 1,522 members as of October 2012. The operation and maintenance management of CCCGP No.1 where the commercial operation was commenced in October will continue to be placed under the charge of the “CCPP Navoi - 478MW Shop” which took charge

of the construction of the same facilities. This organization is staffed by 84 members as of October 2012. Furthermore, the Project Implementation Unit (hereinafter referred to as “PIU”) is already organized within the Navoi thermal power plant. This organization will take charge of the administrative reception office for the construction work of CCCGP No.2 as this Project, following CCCGP No.1. In addition to that, PIU in the SJSC Uzbekenergo headquarters will take charge of the counterpart of this project.



Source: Navoi TPP

Figure 11.1.1-2 Organization Chart of Navoi TPP

Table 11.1.1-1 Actual Personnel in October 2012

Management	Specialist	Workers	Total
178	125	1,219	1,522

Source: Navoi TPP

11.1.2 Financial stability

SJSC Uzbekenergo was established in the form of open joint stock company in 2001. For open joint stock companies, financial audit is mandatory. A domestic auditing firm had audited Uzbekenergo's financial statements every year based on national accounting standards. Although there are still differences between national accounting standards and IFRS, especially on those related with Uzbek civil, tax and corporate legislation, national accounting standards have been being evolved based on IFRS. According to SJSC Uzbekenergo, auditing by a global auditing firm is currently on-going with the support of ADB.

At the end of 2011, SJSC Uzbekenergo was financially sound. Both current ratio and quick ration are more than 1.0 time with sizable margins upon 0.7 times, which is conventionally considered a cut-off point. As both current assets and quick assets were larger than current assets, liquidity is unlikely to be a problem in the foreseeable future. SJSC Uzbekenergo depended mostly on internal funding for its capital investment. Although the debt-to-equity ratio increased for the last several years, Uzbekenergo's debt reached only 30% of its equity in 2011. This suggests that size of debt was at manageable level. In addition, net interest payment was far smaller than EBIT. Uzbekenergo's profitability effectively covered interest payment.

Table 11.1.2-1 Financial Ratios of SJSC Uzbekenergo

	2008	2009	2010	2011	Average
Liquidity					
Current Ratio	1.16	1.18	1.20	1.21	1.19
Quick Ratio	1.10	1.12	1.15	1.06	1.11
Solvency					
Net Interest Payment/EBIT	0.01	0.01	0.02	0.02	0.02
Debt-to-Equity Ratio	3.0%	7.6%	27.1%	30.1%	16.9%
Debt-to-Total Asset	1.2%	3.0%	10.1%	10.7%	6.2%
Profitability					
Net Profit Margin	5.9%	8.6%	7.3%	6.4%	7.1%
Return on Equity (before tax)	14.5%	21.3%	15.8%	14.0%	16.4%
Return on Equity (after tax)	11.5%	17.5%	12.8%	11.4%	13.3%

This project is unlikely to affect the financial health of SJSC Uzbekenergo. As shown in "9.4.5 Financial Analysis", cash flow from operating activities can cover debt service in the base case. Although cash flow is expected to be tight in Year 11-15, healthy balance sheet can absorb unexpected adverse changes in cash flow as long as cash is retained for several years after commissioning. The result suggests that this project is self-sufficient in terms of cash flow and unlikely to need additional financial support after the commencement of commercial operation.

11.1.3 Technological capacities

The “CCPP Navoi-478MW Shop” has an experience in the construction and commissioning of CCCGP No.1 and is considered to have a sufficient level of skill required to implement this Project. Furthermore, some of the engineers have participated in the training course held by the gas turbine manufacturer and have taken part in the witnessed inspection implemented in the factories of the manufacturer so that their technological knowhow level has been improved.
On the other hand, the “CCPP Navoi-478MW Shop” has never experienced the combined cycle power plant operation. Therefore the skill improvement of operation and maintenance is necessary through CCCGP No.1 operating experience.

11.2 Proposal for the operation maintenance management system and scheme for this Project

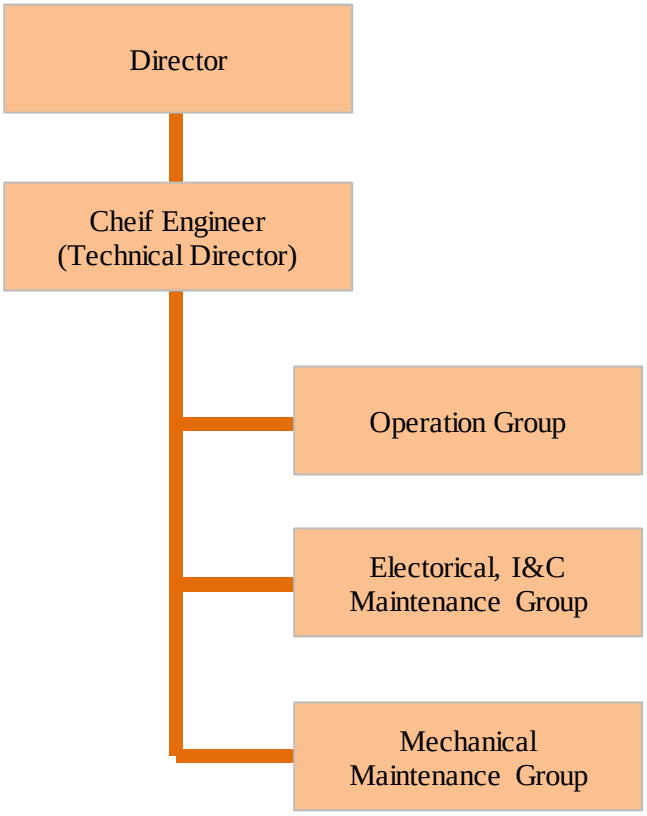
The engineers in the Navoi Thermal Power Plant have never experienced the combined cycle power plant operation and maintenance. It is necessary to be trained in the following skills.

- Trouble response operation and maintenance
- Performance management of CCCGP
- Maintenance of gas turbine

Therefore, the Study Team would like to propose the following for the operation maintenance management for this Project.

(1) Operation maintenance management system for this Project
For the implementation of this Project, the Study Team proposes that those having experience in the construction of CCCGP No.1 should take charge of the major responsible positions in the organization. This is because smoother implementation of the project will result from the organization where the experienced personnel play a major role.

Figure 11.2-1 illustrates the operation maintenance management system proposed by the Study Team.



Source: Study Team

Figure 11.2-1 Operation maintenance management system proposed by the Study Team

Table 11.2-1 shows typical number and the duties of each group.

Table 11.2-1 Typical number and the duties of each group

Group	Type	Number	Duties
Operation Group	Shift Worker	20	・ Stable power supply operation in accordance with the demand power by Load Dispatch Center ・ Operation and monitoring of CCCGP in the central control room ・ Daily maintenance ・ Trouble response operation
	Daytime Worker	10	・ Response to Load Dispatch Center ・ Performance management of CCCGP ・ Response to regular and combustor inspection of piping isolation and power outages operation
Electrical, I&C Maintenance Group	Daytime Worker	10	・ Repair or replacement for gas turbine, steam turbine, HRSG, condenser, pumps, fans and heat exchanger after the accident and for regular and combustor inspection

Group	Type	Number	Duties
Mechanical Maintenance Group	Daytime Worker	10	・ Repair or replacement for generators, transformers, power supplies, switchgear, instruments, control equipment and computer after the accident and for regular and combustor inspection

Source: Study Team

(2) Improvement of operation skill

For the "CCPP Navoi - 478MW Shop", the facilities operation technique has been acquired at the time of commissioning. The Study Team propose introduction of simulator facilities for the purpose of further improvement of the operation skill in future. The simulator facilities contain the functions of performing a series of operations consisting of gas turbine startup, parallel-in, rated load and parallel-off operations in the plant operations. Furthermore, a trouble simulation function is also provided so that training can be conducted in troubleshooting.

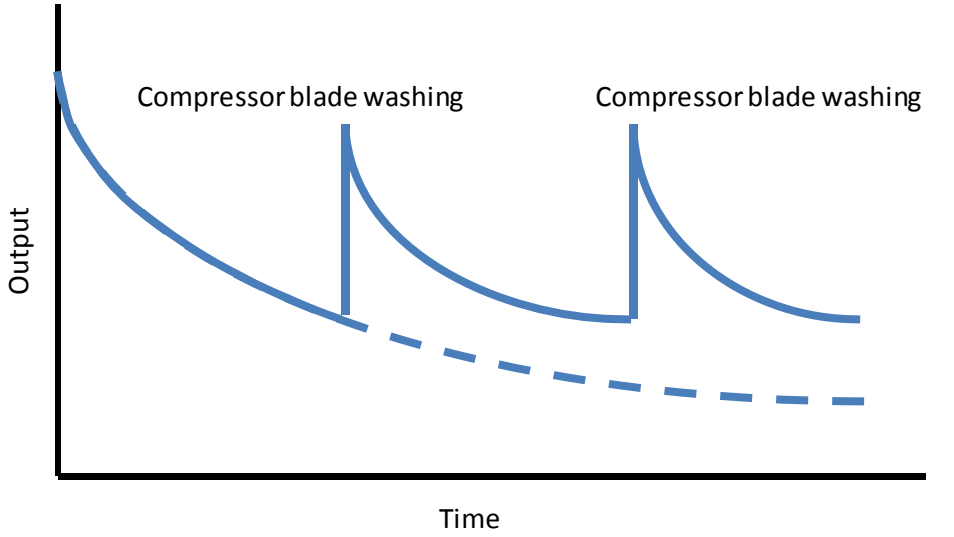
The simulator facilities can be operated on a commonly used PC and are characterized by reduced costs and compact configuration. They can be installed in a training room of the power plant. When software is to be created based on the information of the plant model and control system model in a power plant, the properties inherent to the plant can be represented. This will ensure an advanced level of training efficiency.

(3) Performance management

One of the biggest causes for deterioration of the gas turbine performance is found in the contamination of the compressor passageway. When the gas turbine has been operated for a long period of time, the foreign substances that cannot be removed from air sucked into the compressor will deposit on the vane and passageway of the compressor, with the result that the compressor will be contaminated. Contamination of the compressor will reduce the air flow rate and deteriorates the compressor efficiency so that the output will be subjected to a gradual reduction and the fuel consumption rate will be increased, with the result that the gas turbine performances will be reduced. Compressor blade washing provides one of the methods for recovering the reduced performances of the gas turbine.

The frequency of compressor blade washing is determined by the trade-off between the profit of improving the gas turbine efficiency and the loss caused by suspension of the gas turbine. The Study Team would like to propose that the optimum compressor blade washing frequency should be determined by subsequently accumulating the operation data and compressor blade washing efficiency data.

Figure 11.2-2 illustrates the conceptual view of the compressor blade washing efficiency.



Source: Study Team

Figure 11.2-2 Conceptual view of the compressor blade washing efficiency

(4) Maintenance of gas turbine

The combined cycle power plant includes the major equipment consisting of a gas turbine, steam turbine and HRSG. The maintenance level of the gas turbine in particular out of these major facilities has a serious impact on the availability factor of the overall power generation facilities.

The combustor and turbine blade as hot parts of the gas turbine are operated at a high temperature of more than 1,000°C. Thus, these hot parts require inspection, repair and replacement in shorter intervals of time due to more serious deterioration and damage, as compared with the blade of the steam turbine. For each of these hot parts, the expected service life and inspection time intervals are determined by the Original Equipment Manufacturer (hereinafter referred to as "OEM"). Table 11.2-2 illustrates an example of the time intervals for gas turbine inspection. The Study Team would like to propose that the hot parts should be inspected and replaced under supervision of the technical advisor of the OEM.

Table11.2-2 An example of time intervals for gas turbine inspection

Type of Inspection	Inspection Interval
Combustor Inspection	8,000 hour
Turbine Inspection	16,000 hour
Major Inspection	48,000 hour

Source: Study Team

Since the hot parts are made of superalloy based on nickel and cobalt, special welding technique and coating skill are required to repair these parts. Thus, it is a common practice to repair these hot parts in the OEM factory. Generally, approximately three months are required to repair the hot parts, although this depends on the degree of a particular damage. Further, when consideration is given to the transportation period from the power plant to the OEM factory, a considerable time period will be required. To solve this problem, The Study Team would like to propose that one set of spare parts should be kept in stock as spare parts.

Chapter 12 CDM Related Surveys

12.1 CDM Methodology

In CDM, the emission reduction volume under the project is defined as follows:

・Emission reduction volume = Baseline emission volume - Project emission volume

A project emission volume refers to the volume of emission from an actual project, whereas the emission volume in the baseline scenario means an emission volume in a "scenario unrealized if the project does not fall under a CDM project."
This project is power generation and heat supply business. UNFCCC (United Nations Framework Convention on Climate Change) stipulates the specific method in the following report:
・AM 0048 – Electric Power Stations of Cogenerative Type which Operate on Carbon Fuel and Produce Heat and Electric Energy for Consumer and Produce Electric Power in Network)

The EIA of this project calculates the emission reduction volume according to the stipulations in the above-mentioned report. The specific calculation method and calculation results are mentioned in page 63 of EIA.

12.1.1 Estimation of Effect of GHG Reduction Based on the CDM Methodology

(1) Calculation result

a. Baseline emission volume

The annual baseline emission volume is obtained by multiplying the annual power supply from the project operation to the power networks in Uzbekistan by the baseline emission coefficient of the power networks in Uzbekistan.

- Annual power supply: 450,000 kW × 8,000 hr = 3.60 GWh
- Emission coefficient: 593 g CO_2 / kWh
  Reference: UNDP Project "Capacity Building for MChR in Uzbekistan"
- Annual baseline emission volume: 2,134,800 t CO_2

b. Project emission volume

The annual project emission volume is obtained by multiplying the annual fuel consumption by the project by the CO2 emission coefficient.

- Annual fuel consumption: 763.5 × 10^6 Nm^3 (natural gas)
- Emission coefficient: 1.9 t CO_2 / 1,000 Nm^3
- Annual project emission volume: 1,450,650 t CO_2

c. Emission reduction volume when the project is implemented

The annual reduction volume when the project is implemented will be 684,150 t CO2, which is the result when the project emission volume is subtracted from the annual baseline emission volume mentioned above.

- Annual emission reduction volume = 2,134,800 t CO_2 - 1,450,650 t CO_2 = 684,150 t CO_2

12.2 CDM Related Procedure

The DNA (Designated National Authority) of Uzbekistan, the Technology Transfer Agency under the Ministry of Economy of the nation, is responsible for CDM.
Uzbekistan worked on the introduction of global warming gas emission control measures. As a result, the nation has introduced as many as 100 laws and regulations, including the "Law of Republic of Uzbekistan on the Rational Energy Use" enacted in 1997, to protect the environment directly and indirectly and control use of natural resources and energy.
(Source: http://www.jef.or.jp/PDF/report_b7_h20.pdf)

12.3 CDM Application

Uzbekistan has established the DNA in the country and been working on CDM projects ever since to meet the Kyoto Protocol.
To this end, the Government of Uzbekistan picked up 33 projects in 2009 to work on whether CDM is applicable to these projects.

Table 12.3-1 Projects Where Uzbekistan Worked on CDM Application (2009)

CDM Project Portfolio		
Type	(a) Number of projects listed	(b) Number of projects listed: PIN
Small-scale hydropower generation	10	8
Improvement in chemical processes	7	0
Compressor-driven motor changed-speed operation	5	4
Associated gas utilization (including flaring)	5	0
LFG collection	5	0
Nat-Gas leak reduction (incl. collection)	4	1
Power generation by gas turbines	3	1
Improvement in heat source facilities	3	0
Cogeneration	3	2
Livestock/poultry bio power generation	3	0
Power transmission and distribution	3	1
Wind power/solar power generation	2	0
Other	4	2

Note: The projects in section (a) above are those where the DNA who has decided to work on CDM application, according to the developer's information.
The projects in section (b) are those, among the projects in section (a), in an advanced stage where detailed study for CDM application was carried out.
(Source: http://www.jef.or.jp/PDF/report_b7_h20.pdf)

CDM application in the power generation sector has been studied mostly by SJSC Uzbekenergo. This body has been working currently to file application documents of this project and preceding CCCGP No.2 Project in 2013 to the Ministry of Economy.

Chapter 13 Workshop in Japan

13.1 Purpose of Workshop

This workshop was held to obtain findings and experiences that could be effectively employed in the phase of implementing a yen loan project in the future. The counterparts of Uzbekistan were invited to Japan to make a field trip to the factories of major equipment manufacturers and combined cycle power plants and to listen to the lectures on the combined cycle power generation, in such a way that the related people would get required information.

13.2 Schedule and Lists of Trainees in Workshop

With the cooperation of Japanese Gas Turbine and HRSG manufacturers, the trainees of SJSC Uzbekenergo were invited to visit the Gas Turbine Works and the Steam Turbine and HRSG Works from February 25 and 27 March, 2013. The trainees also visited the Kawasaki Thermal Power Plant of TEPCO to extend their knowledge of operation and maintenance of the modern combined cycle power plant.

The trainees of SJSC Uzbekenergo are listed in Table 13.2-1 List of SJSC Uzbekenergo's trainees.

Table 13.2-1 List of SJSC Uzbekenergo's trainees

No	Name	Position	
1	Mr. AZIMJON YAKUBOV	Deputy Chief Engineer	Navoi TPP
2	Mr. KHURSHID KHUSHVAKOV	CCPP Operator	Navoi TPP
3	Mr. UTKIR IKROMOV	Deputy Chief of CCPP-1 (repair)	Navoi TPP
4	Mr. ALVAR GAYBULLAEV	Engineer	SCSJ Uzbekenergo headquarters
5	Mr. KHAMDAM ESHEV	Electric shop engineer	Navoi TPP
6	Mr. ISTAM TOSHOV	Engineer	Navoi TPP
7	Mr. TUYMUROD MENGLIEV	Electric shop engineer	Navoi TPP
8	Mr. AZIZJON PULOTOV	Operator	Navoi TPP
9	Mr. ISMAIL ISLAMOV	Senior foreman for repair of CCPP-1	Navoi TPP
10	Mr. SHUKHRAT DOSTOV	Engineer	Navoi TPP

13.3 Workshop Contents

(1) Kick off meeting
Date: February 20, 2013
Implementation contents:

- Explanation on JICA's Roles, Functions and Activities


Figure 13.3-1 Kick off meeting at JICA

(2) Lecture
Date: February 21, 2013
Implementation contents:

- Technical explanation on Combined Cycle Power Plant (CCPP)

Material: Refer Appendix 13-1.


Figure 13.3-2 Lecture at TEPSCO

(3) Kawasaki Thermal Power Station of TEPCO
Date: February 22, 2013
Item: Tour to Thermal Power Station
Implementation contents:

- Explanation on TEPCO overview
- Thermal power plant tour
- Explanation on actual interval for gas turbine inspection

- Explanation on type of water treatment system


Figure 13.3-3 Visit to Kawasaki P.S. of TEPCO

(4) Gas Turbine Work in Japan

Date: February 25, 2013
Item: Tour to Gas Turbine Manufacturing Factory
Implementation contents:

- Explanation on factory overview
- Factory tour (Gas turbine)
- Discussion about problem for freezing of gas turbine compressor inlet air filter at Navoi CCCGP No.1


Figure 13.3-4 Visit to Gas Turbine Works in Japan

(5) Steam Turbine and HRSG Works in Japan

Date: February 27, 2013
Item: Tour to Steam Turbine and HRSG Manufacturing Factory
Implementation contents:

- Explanation on factory overview
- Factory tour (Steam turbine, HRSG)


Figure 13.3-5 Visit to Steam Turbine and HRSG Works in Japan

Appendix 13-1 Material

SJSC "Uzbekenergo"

Technical Explanation on Combined Cycle Power Plant (CCPP)

February 2013

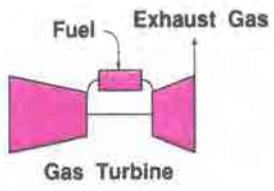
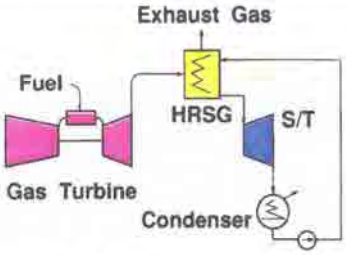
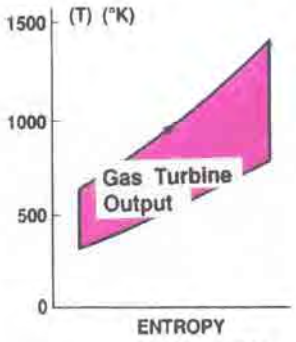
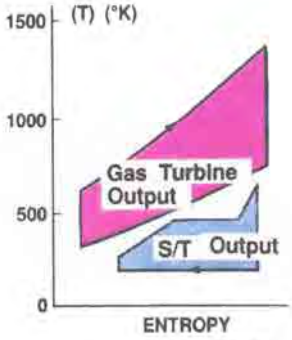
Japan International Corporation Agency (JICA)

Tokyo Electric Power Services Co., Ltd. (TEPSCO)

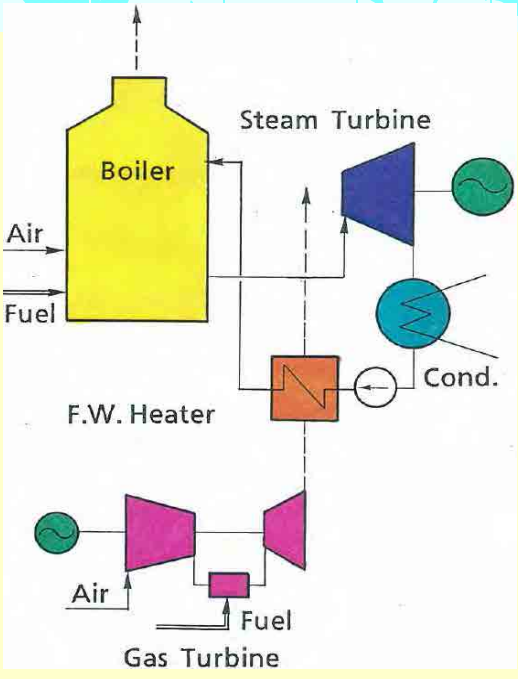
Specific Features of Combined Cycle Power Plant

1. **Highest Thermal Efficiency**
2. **Fast Start-up & Rapid Load Change**
3. **Less Impact on Environment**
4. **Less Cooling Water Requirement**
5. **Phased Construction with Power Demand Increase**
6. **Less Construction Cost per kW**
7. **Fully Automatic Controlled Operation**

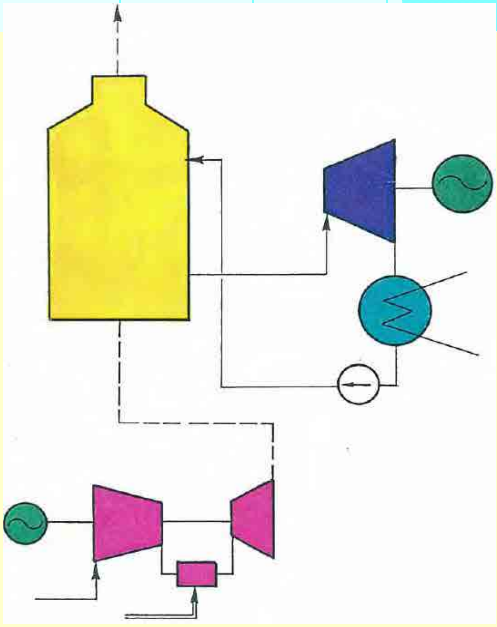
Performance Relationship between GTC and CC

	Gas Turbine Cycle	Combined Cycle
System		
T-S Diagram		
Output Efficiency	100% 100%	150% 150%

Type of Combined Cycle Power Plant (1/2)

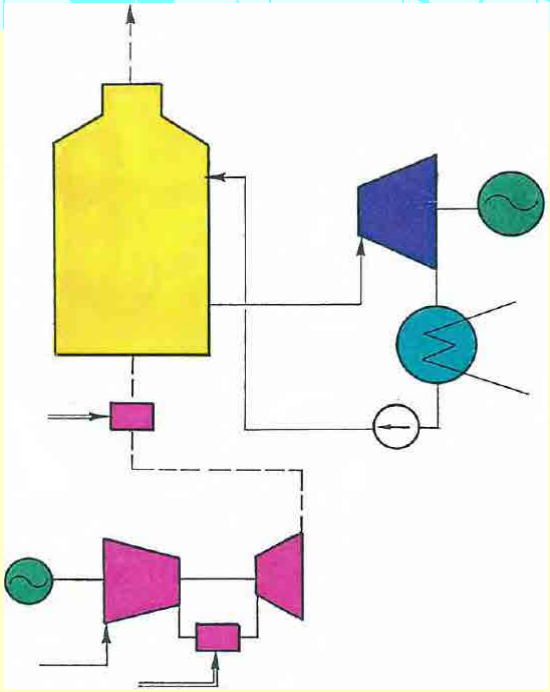


Feed Water Heating Type

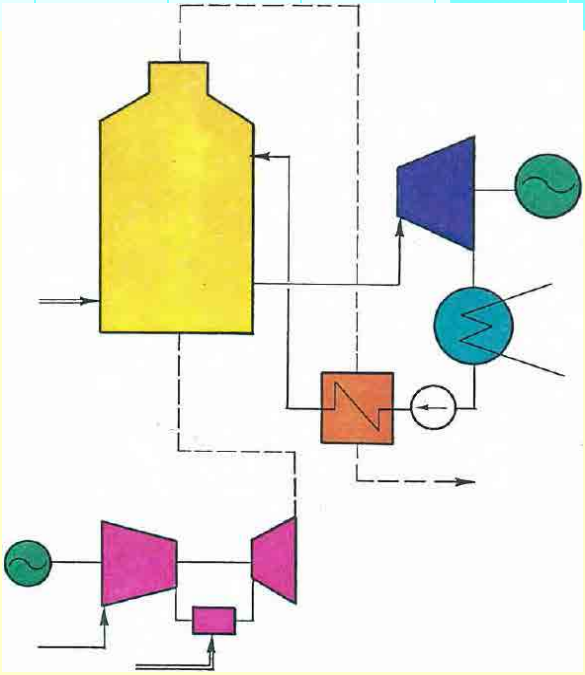


Unfired Type

Type of Combined Cycle Power Plant (2/2)

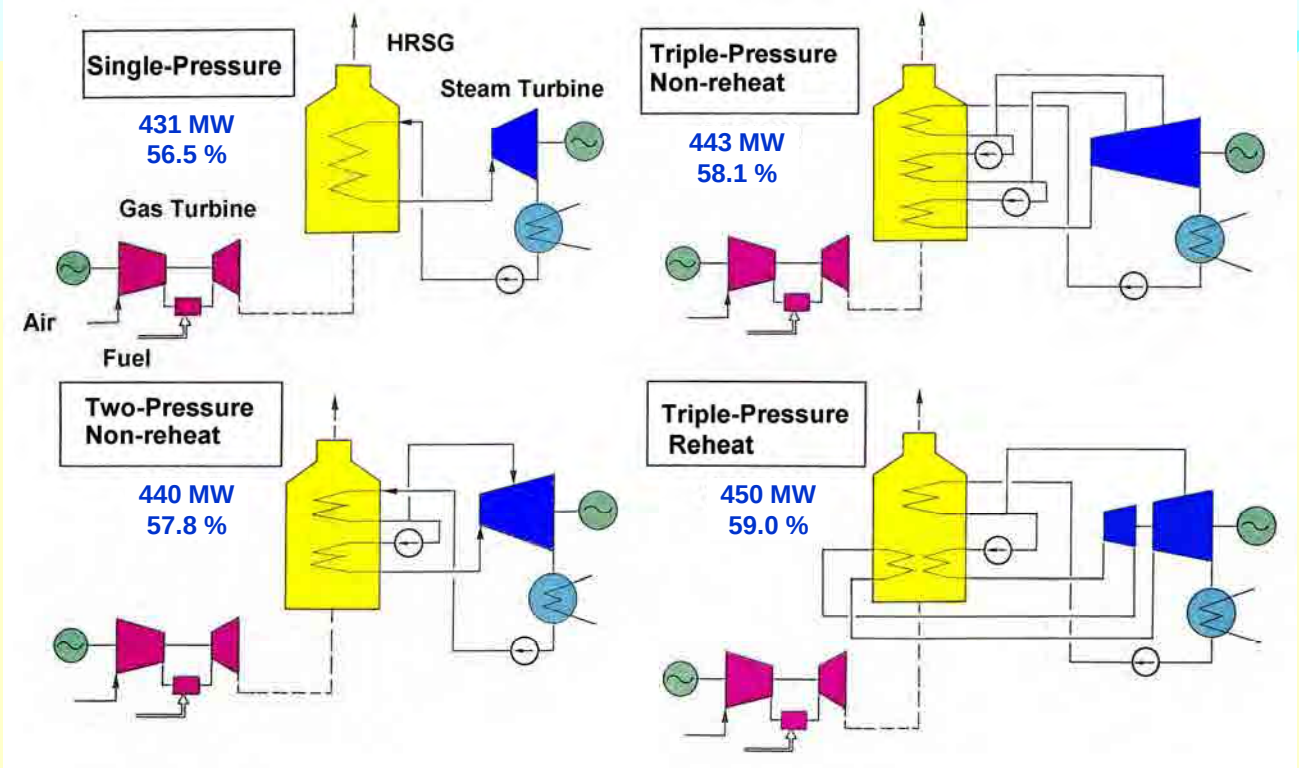


Supplementary Fired Type

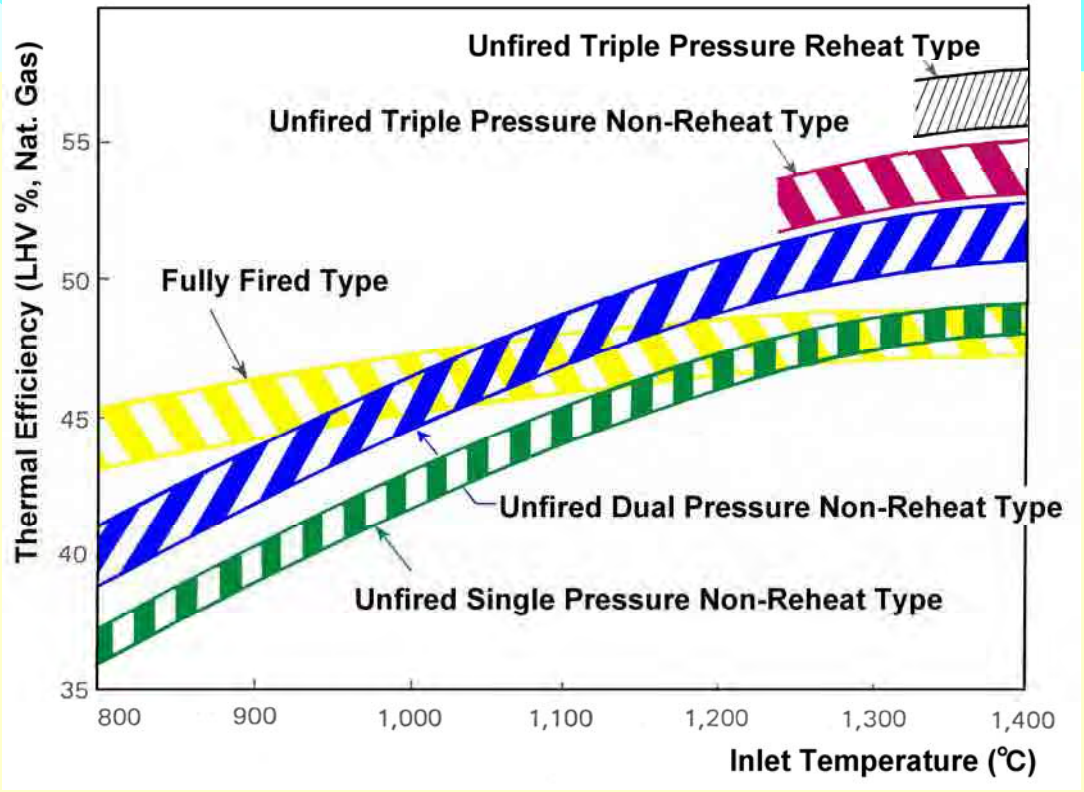


Fully Fired Type

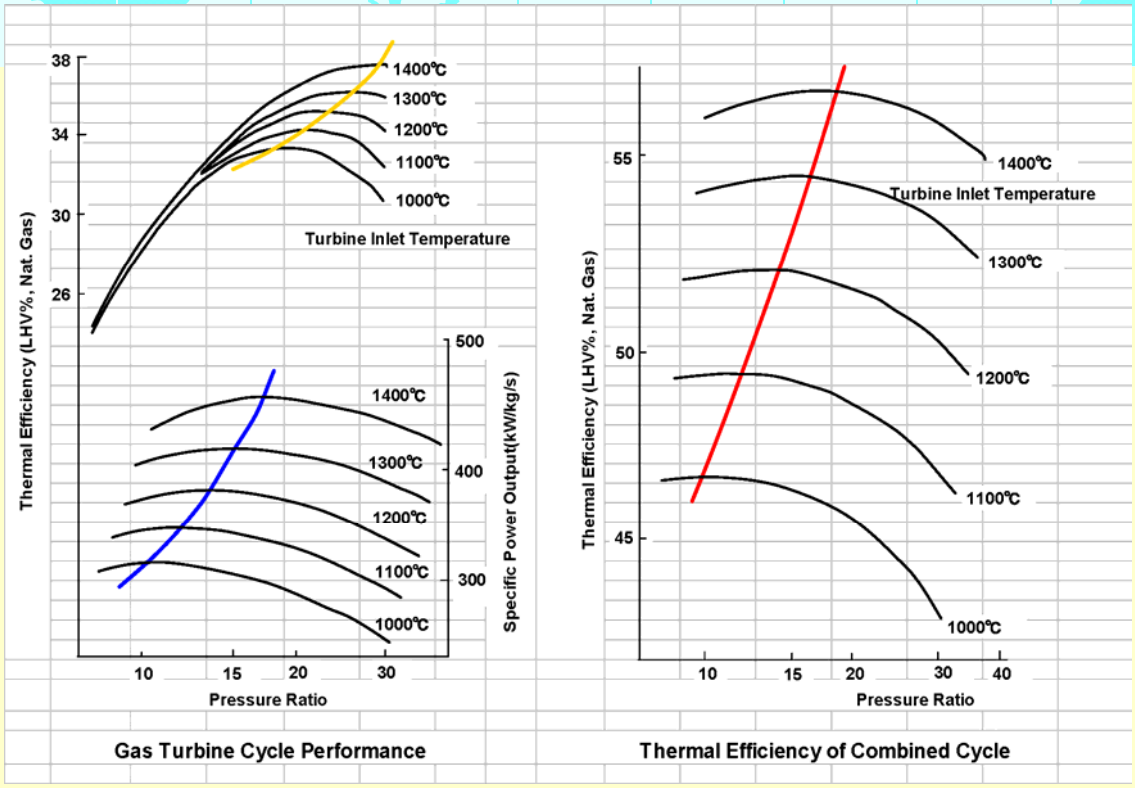
Efficiency Change due to Type of Bottoming System



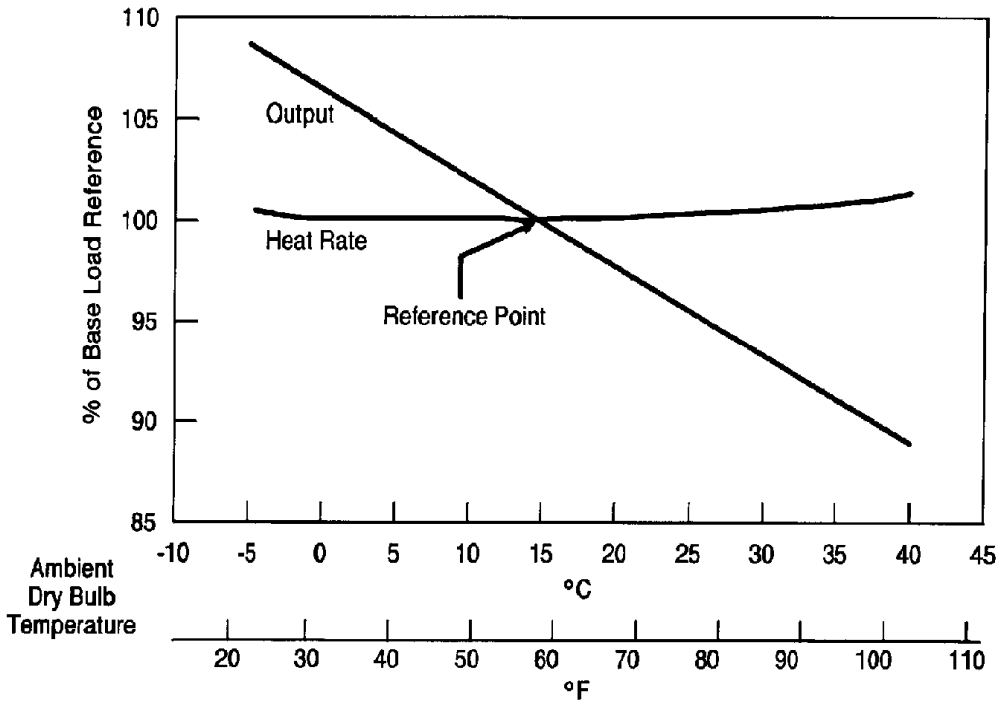
CCPP Efficiency Change due to GT Temperature



Relationship between GT and CC Performances

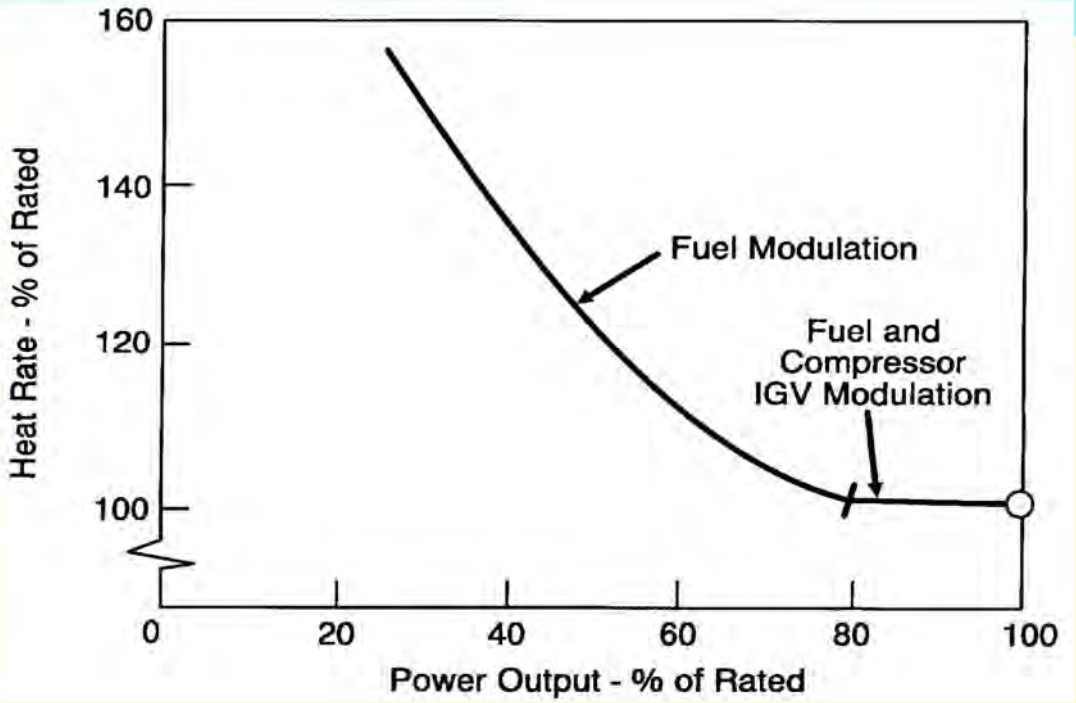


Performance Variation of CCPP with Ambient Temperature



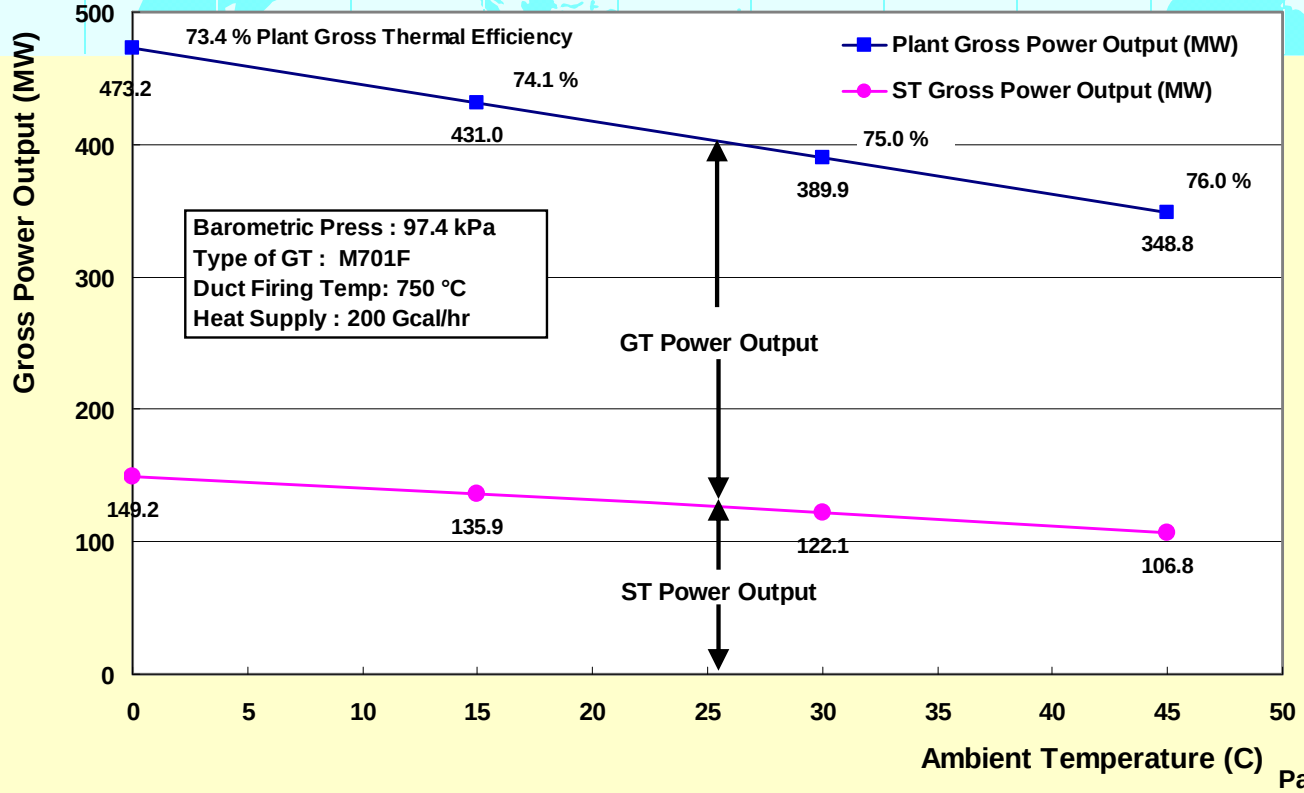
Data Source: GE Library 3967c

Heat Rate Variation of CCPP with Power Output

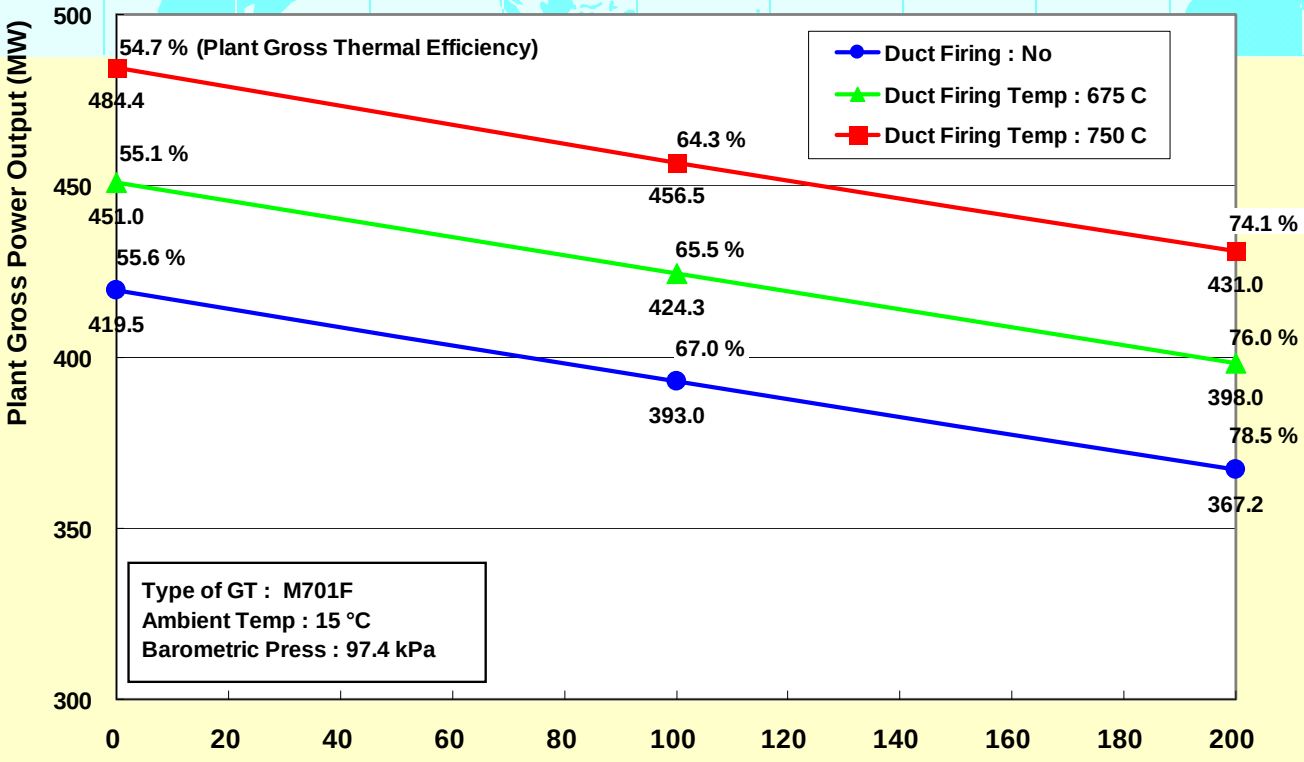


Data Source: GE Library 3967c

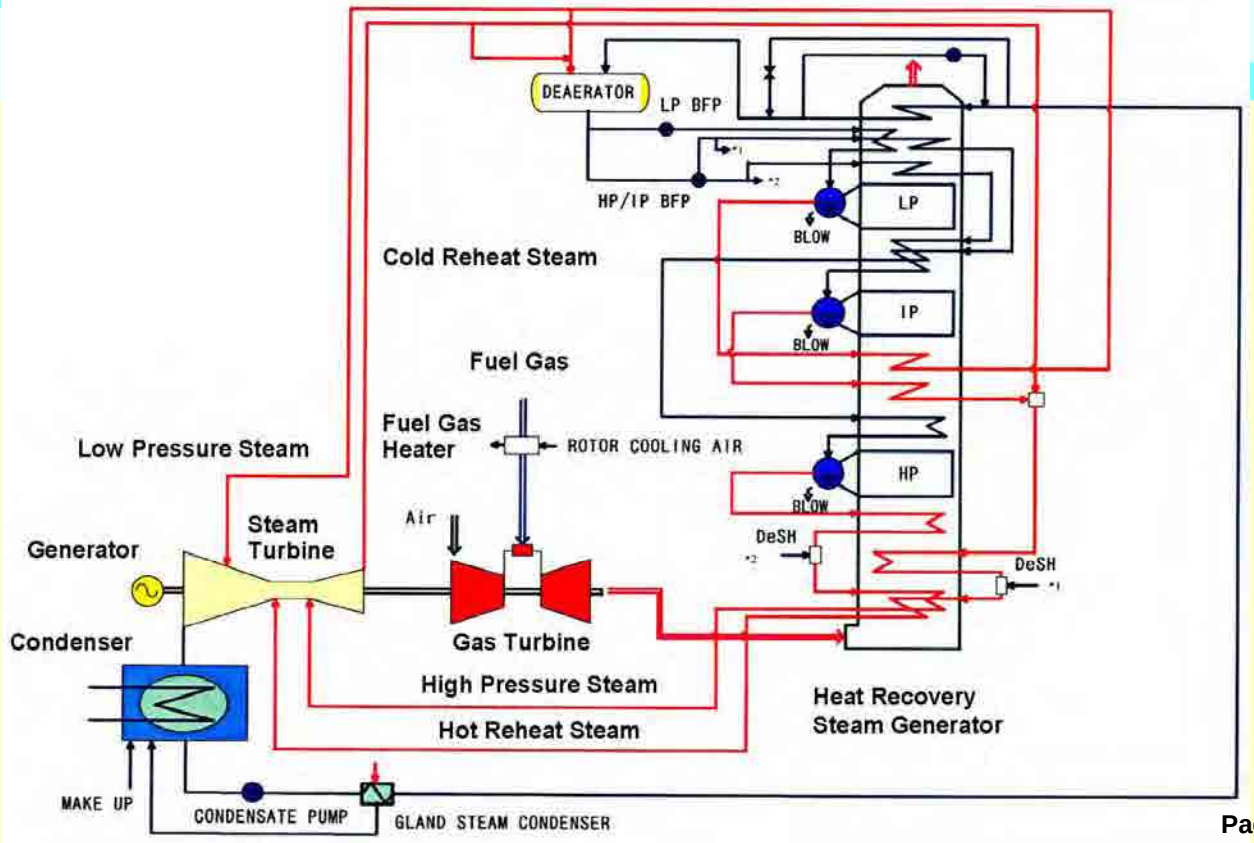
Performance Variation with Ambient Temperature of Navoi CC Cogeneration Plant



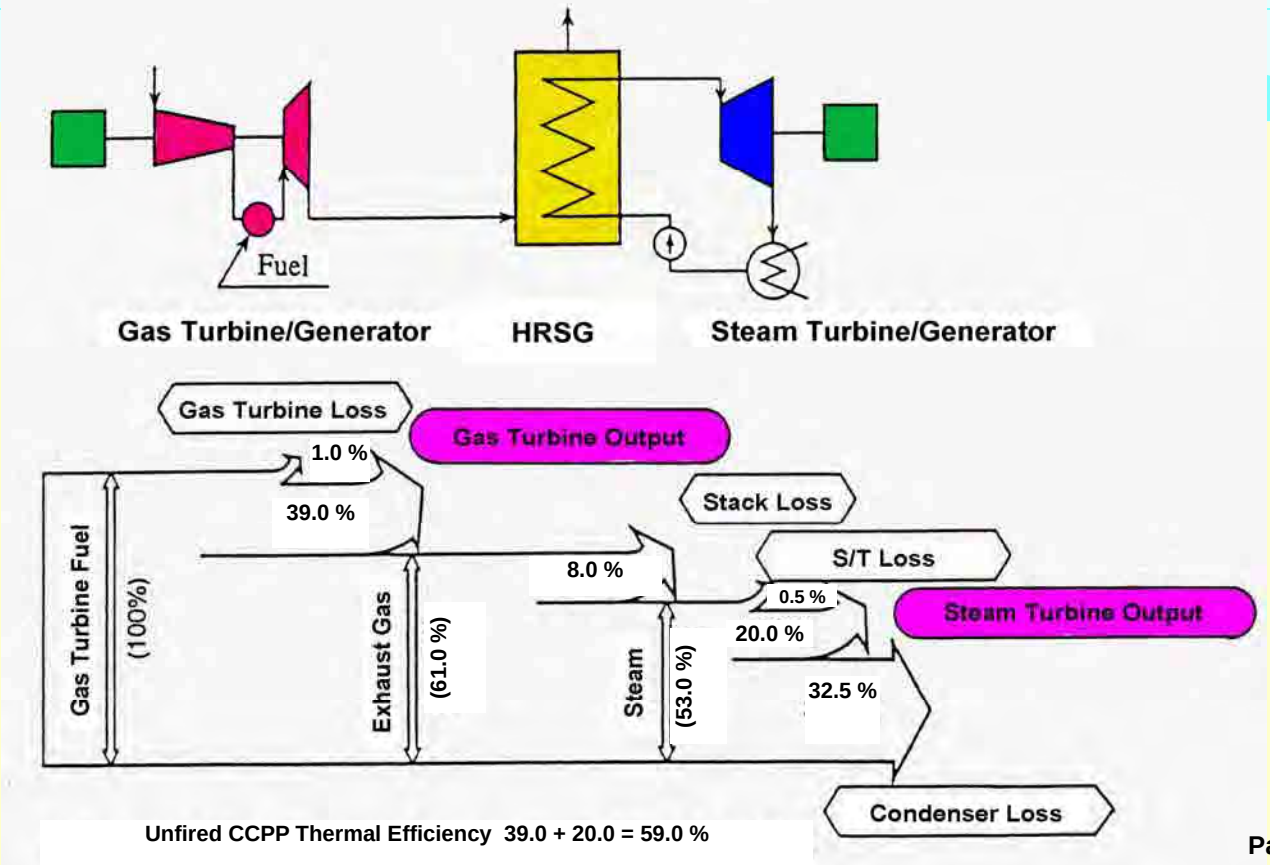
Relationship between Power Output and Heat Supply Amount of Navoi CC Cogeneration Plant



Typical Diagram of Triple-Pressure Reheat CCPP



Typical Heat Balance of Unfired CCPP



Unfired CCPP Thermal Efficiency 39.0 + 20.0 = 59.0 %

Specification of Large Capacity Gas Turbines for 50 Hz Use

Manufacturer	Alstom		General Electric	
Type of Model	GT 26	GT 26	PG9351 (FA)	PG9371 (FB)
Type of Class	F	F	F	F
Gross Power Output (MW)	292.1	292.8	256.2	284.2
Gross Thermal Efficiency (%)	38.5	39.6	37.0	37.9
Pressure Ratio	34.7	34.2	16.6	18.0
Air Flow Rate (kg/s)	653.2	644.1	642.9	654.1
Exhaust Temperature (℃)	615	614	599	642
Specific Power Output (kW/kg/s)	447	455	399	434
Fuel to Air Ratio (%)	2.37	2.34	2.20	2.34
ISO Turbine Inlet Temp Difference (°C)	Base	Approx -10	Base	Approx +70
Remarks	GTW HB Vol.28 with AQC	GTW HB Vol.28 with OTC	GTW HB Vol.28	GTW HB Vol. 28

Manufacturer	Mitsubishi		Siemens	
Type of Model	M701F3	M701F4	SGT5-4000F	SGT5-4000F
Type of Class	F	F	F	F
Gross Power Output (MW)	278.3	312.1	286.6	292.0
Gross Thermal Efficiency (%)	38.7	39.3	39.5	39.8
Pressure Ratio	17.0	18.0	17.9	18.2
Air Flow Rate (kg/s)	649.5	702.6	689.5	692.2
Exhaust Temperature (℃)	592	597	577	577
Specific Power Output (kW/kg/s)	428	444	416	422
Fuel to Air Ratio (%)	2.26	2.31	2.15	2.16
ISO Turbine Inlet Temp Difference (°C)	Base	Approx +30	Base	Approx +10
Remarks	GTW HB Vol.25	GTW HB Vol.28	GTW HB Vol.26	GTW HB Vol.28

Note 1. Above figures are made up with data from Gat Turbine World Handbooks of Vol. 25,26 and 28.
2. Above figures are for ISO conditions on Natural Gas.
3. Efficiency is based on LHV of Natural Gas fuel.
4. LHV is assumed to be 49,000 kJ/kg.

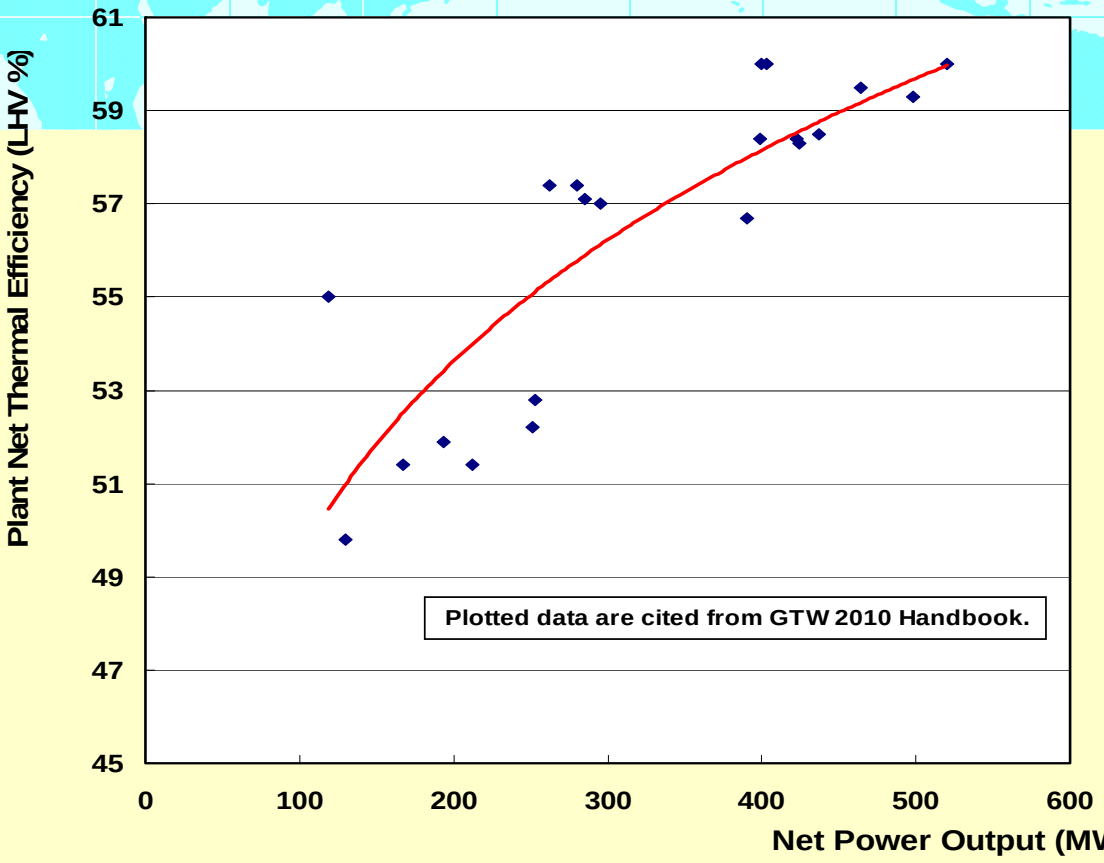
Expected Performance of 1 on 1 Large Capacity CCPP

Manufacturer	Alstom		General Electric	
Type of Model	KA 26-1	KA 26-1	109FA	109FB
Model of Gas Turbine	GT 26	GT 26	9FA	9FB
Type of Bottoming Cycle	Reheat Triple-pressure	Reheat Triple-pressure	Reheat Triple-pressure	Reheat Triple-pressure
Plant Net Power Output (MW)	410.3	424.0	390.8	437.2
Plant Net Thermal Efficiency (%)	57.8	58.3	56.7	58.6
Condenser Pressure (kPa)	-	-	4.1	4.1
Remarks	GTW HB Vol.24	GTW HB Vol.28	GTW HB Vol.28	GTW HB Vol.28

Manufacturer	Mitsubishi		Siemens	
Type of Model	MPCP1(M701)	MPCP1(M701F)	SCC5-4000F	SCC5-4000F
Model of Gas Turbine	M701F3	M701F4	SGT5-4000F	SGT5-4000F
Type of Bottoming Cycle	Reheat Triple-pressure	Reheat Triple-pressure	Reheat Triple-pressure	Reheat Triple-pressure
Plant Net Power Output (MW)	416.4	464.5	416.0	423.0
Plant Net Thermal Efficiency (%)	59	59.5	58.2	58.4
Condenser Pressure (kPa)	-	5.1	-	-
Remarks	GTW HB Vol.25	GTW HB Vol.28	GTW HB Vol.26	GTW HB Vol.28

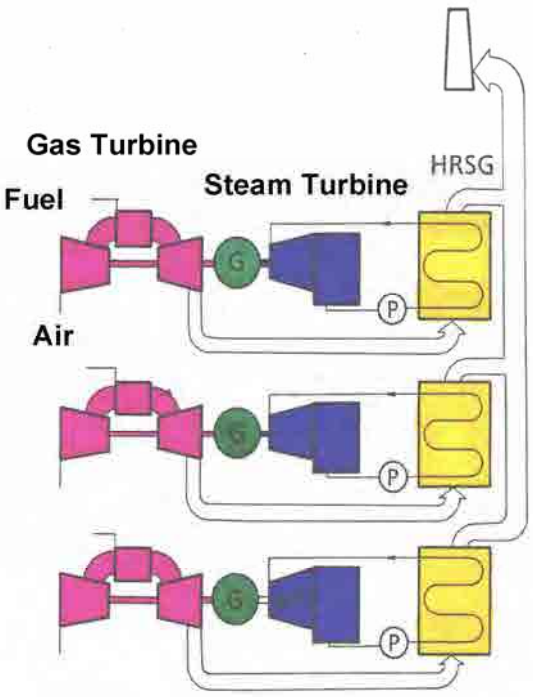
Note 1. Above figures are made up with data from Gat Turbine World Handbooks of Vol. 24 to 28.
2. Above figures are for ISO conditions on Natural Gas.
3. Efficiency is based on LHV of Natural Gas fuel.

Plant Net Thermal Eff. of 1 on 1 Type CCPP

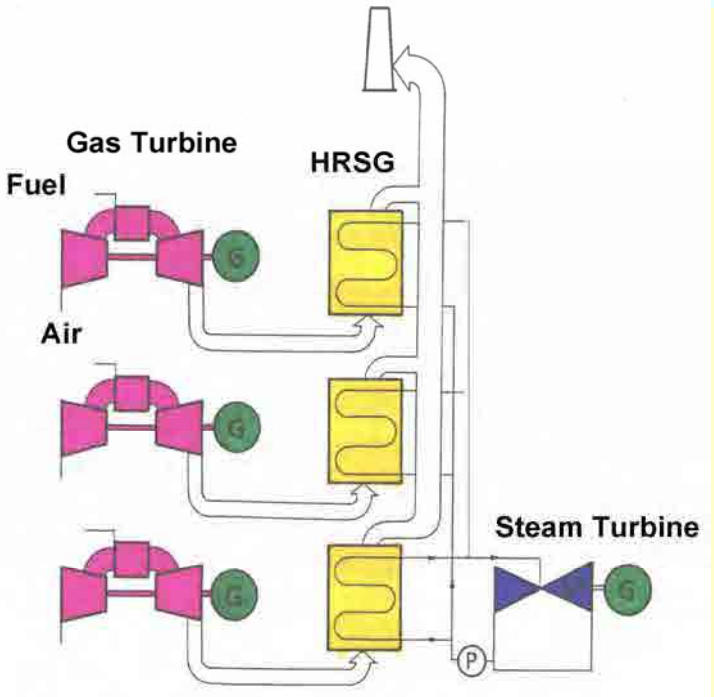


Shaft Configuration of CCPP

Single-shaft Type



Multi-shaft Type



Simple Comparison of Single and Multi-shaft Design CCPP

1 on 1 Single-shaft Design		1 on 1 Multi-shaft Design	
Relative Advantage	**Relative Disadvantage**	**Relative Advantage**	**Relative Disadvantage**
1. Easier start/stop operation due to simple shaft configuration 2. Less construction cost due to less electrical equipment 3. Slightly higher thermal efficiency due to employment of large capacity generator	1. No simple cycle operation of GT 2. Difficult inland transportation due to more heavy and bulky cargos	1. Higher availability operation to be expected due to GT simple cycle operation 2. Less capacity of start-up device 3. Phased construction with power demand increase	1. Slightly complicated operation 2. Higher construction cost due to many electrical equipment 3. More construction area requirements

Overall Engineering Activities on CCPP of TEPSCO

Type of Engineering Service	No. of Projects	No. of Different Outside Countries	Total Capacity (MW)	Remarks
Feasibility Study	25	17	10,606	Saudi Arabia, Uzbekistan, Sri Lanka, Turkmenistan, Rumania, Philippines, Mainland China, Viet Nam, Thailand, Bangladesh, Mozambique and others
Pre and Post-contract Consultancy Service	10	6	4,710	Malaysia, Azerbaijan, Uzbekistan (ES-I), Armenia, Indonesia, Bangladesh,
Specific Engineering Service and Detailed Design	10	for TEPCO	13,360	TEPSCO provides detailed designs of buildings, foundations and BOP piping systems of all power stations of TEPCO.
Other Engineering Service	10	7	5,214	TEPSCO provides engineering services as an independent engineer and such as SAPROF and SAPI.
Total	55	21	33,890	

Pre and Post Contract Consultancy Services of CCPP

Name of Project	Country	Unit Capacity (MW)	Type of Fuel	Type of Shaft Configuration	Model No. of GT	Start-up Year	Type of Service	Financed by
Port Dickson #1	Malaysia	750	Nat. Gas	Multi-shaft (2 on 1)	M701F	2006	Full consultancy	JBIC
Port Dickson #2	Malaysia	750	Nat. Gas	Multi-shaft (2 on 1)	MS9001FA	2008	Full consultancy	JBIC
Tashkent TPP	Uzbekistan	370 (with Heat Export)	Nat. Gas	Multi-shaft (1 on 1)	Undecided	Terminated	Pre-contract consultancy	JICA
Shimal #1	Azerbaijan	400	Nat. Gas	Single shaft	M701F	2005	Subordinate consultancy	JBIC
Shimal #2	Azerbaijan	400	Nat. Gas	Single shaft	M701F	2013	Full consultancy	JBIC
Yerevan	Armenia	205 (with Heat Export)	Nat. Gas	Multi-shaft (1 on 1)	GT13E2	2010	Full consultancy	JICA
Japan Railway East Kawasaki	Japan	200	LNG	Multi-shaft (1 on 1)	M701D	2013	Pre-contract consultancy	Own finance
Muara Karang	Indonesia	740	Nat. Gas	Multi-shaft (2 on 3)	M701F	2011	Full consultancy	JBIC
Muara Tawar	Indonesia	241	Nat. Gas	Multi-shaft (1 on 1)	GT13E2	2011	Full consultancy	JBIC
Tanjung Priok	Indonesia	740	Nat. Gas	Multi-shaft (2 on 1)	M701F	2012	Full consultancy	JBIC

Combined Cycle Power Plants of TEPCO in Japan

Name of Power Station	Block No.	Unit No.	Unit Capacity (MW)	Block Capacity (MW)	Type of Fuel	Type of Shaft Configuration	Model No. of GT	Design Efficiency (% LHV)	Start-up Year of 1st Unit
Futtsu	1	7	165	1,000	LNG	Single Shaft	MS9001E	47.2	1985
	2	7	165	1,000	LNG	Single Shaft	MS9001E	47.2	1987
	3	4	380	1,520	LNG	Single Shaft	MS9001FA +	55.3	2001
	4	3	507	1,520	LNG	Single Shaft	MS9001H	58.6	2008
Yokohama	7	4	350	1,400	LNG	Single Shaft	MS9001FA	54.1	1996
	8	4	350	1,400	LNG	Single Shaft	MS9001FA	54.1	1996
Chiba	1	4	360	1,440	LNG	Single Shaft	M701F	54.2	1998
	2	4	360	1,440	LNG	Single Shaft	MS9001FA	54.2	1999
Shinagawa	1	3	380	1,140	City Gas	Single Shaft	MS9001FA +	55.3	2001
Kawasaki	1	3	500	1,500	LNG	Single Shaft	M701G2	58.6	2007
	1	3	500	1,500	LNG	Single Shaft	M701G2	58.6	2013
Total	10	43	-	14,860	-	-	-	-	-

Yokohama Combined Cycle Power Station

Chiba Combined Cycle Power Station

Kawasaki Combined Cycle Power Station

IPP Business of TEPCO in Foreign Country

Name of Project or Plant	Country	Type of Power Plant	Type of Fuel	Power Output (MW)	Start-up Year	Remarks
Loy Yang A	Australia	Conventional Power Plant	Pulverized Coal	2,200 in Total	1984 ~ 1988	Brown coal
Phu My II-2	Vietnam	Combined Cycle Power Plant	Natural Gas	715 ×1	2005	2 on 1 9FA
Chang Bin	Republic of China	Combined Cycle Power Plant	Natural Gas	490 ×1	2004	2 on 1 M501F
Fong Der	Republic of China	Combined Cycle Power Plant	Natural Gas	490 × 2	2004	2 on 1 M501F
Star Buck	Republic of China	Combined Cycle Power Plant	Natural Gas	490 × 1	2009	2 on 1 7FB
Um Al Nar Power and Desalination	United Arab Emirates	Combined Cycle Cogeneration Plant	Natural Gas	1,550 in Total with 110,000 ton/day	2007	5 on 2 9FA
Paiton I	Indonesia	Conventional Power Plant	Pulverized Coal	615 × 2	1999	Sub-bituminous
Paiton III	Indonesia	Conventional Power Plant	Pulverized Coal	815 × 1	2012	Sub-bituminous
Pagbilao	Philippine	Conventional Power Plant	Pulverized Coal	375 × 2	1996	
Sual	Philippine	Conventional Power Plant	Pulverized Coal	609 × 2	1999	
Ilijan	Philippine	Combined Cycle Power Plant	Natural gas	625 × 2	2002	2 on 1 M501F