

Environmental Monitoring Report

Semi Annual Report
March 2020

Uzbekistan: Solid Waste Management Improvement Project

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Solid Waste Management Improvement Project

ADB Loan No.: 3067-UZB

**PROJECT MANAGEMENT, IMPLEMENTATION AND
SUPERVISION CONSULTANCY SERVICES**

Contract No.: SUE/Maxsustrans/QCBS-Cons_1-2016-01



Semi-Annual Environmental Monitoring Report

Reporting Period: July - December 2019

CLIENT – IMPLEMENTING AGENCY

State Unitary Enterprise (SUE) “MAXSUSTRANS” (Uzbekistan)

LEAD CONSULTANT

H.P. Gauff Ingenieure GmbH & Co. KG-JBG (Germany)

in association with

Infratech Consulting SDN Ltd. (Uzbekistan)

January 2020

Semi-Annual Environmental Monitoring Report

Project No: 45366
Reporting period: July - December 2019
ADB Loan: 3067-UZB

UZB: Solid Waste Management Improvement Project (SWMIP) (Financed by the ADB)

Prepared by: Mr. Sergey Karandayev, National Environmental Specialist of PIU Consultants - JV «H.P. Gauß Ingenieure GmbH & Co. KG – JBG- (Germany) and Infratech Consulting SDN Ltd. (Uzbekistan)

For: State Unitary Enterprise «Maxsustrans», Khokimiyat of Tashkent city and ADB

Endorsed by: Mr. Rustam Shukurov - Head of PIU

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ABBREVIATIONS

| | |
|--------------------|---|
| ADB | Asian Development Bank |
| CDP | Corporate Development Program |
| CSC | Construction Supervision Consultant |
| EA | Executing Agency |
| EHS | Environmental Health & Safety |
| EIA | Environmental Impact Assessment |
| EIP | Environmental Impact Permit |
| EMP | Environnemental Management Plan |
| ES | Environmental Specialist |
| GoU | Government of Uzbekistan |
| GRM | Grievance Redress Mechanism |
| IA | Implementing Agency |
| IEE | Initial Environmental Examination |
| LARP | Land Acquisition and Resettlement Plan |
| Maxsustrans | State Unitary Enterprise "Maxsustrans" |
| MSW | Municipal Solid Waste |
| PIU | Project Implementation Unit |
| SC | Supervision Consultant |
| SCEEP | State Committee of the Republic of Uzbekistan of Ecology and Environment Protection |
| SLF | Sanitary Landfill Facility |
| SPS | Safeguard Policy Statement |
| SSEMP | Site-specific Environmental Management Plan |
| SWM | Solid Waste Management |
| SWMIP | Solid Waste Management Improvement Project |

1. INTRODUCTION

1.1. General

1. As per the Project Agreement for the L3067-UZB: Solid Waste Management Improvement Project (SWMIP), State Unitary Enterprise "MAXSUSTRANS" and Project Implementation Unit (PIU) is bound to ensure that (i) the project is constructed and operated in accordance with the national and local environmental regulations and guidelines, ADB's Environment Policy (2002) and the initial environmental examination (IEE) report; (ii) any adverse environmental impacts arising from the construction and operation of the project facilities are minimized by implementing the mitigation measures. Environmental monitoring program and other recommendations presented in the IEE report; and (iii) the implementation of the environmental management plan (EMP) and violations of safety or environmental standards, if any, be regularly reported to ADB.

2. This report is the 8-th EMR for the project and covers July – December 2019 reporting period. This Semi-annual environmental monitoring report describes the implementation of the environmental monitoring and mitigation measures recommended in the IEE reports, analyzes environmental data collected from the related sub-projects during the period of July – December 2019, and provides recommendations for the resolution of identified issues.

3. To be more specific, this environmental monitoring report covers the following areas: (i) documentation review and compliance assessment with the applicable environmental regulations, (ii) environmental management institutional structure and responsibilities, (iii) mitigation measures undertaken to minimize adverse environmental impacts arising from the construction, (iv) environmental monitoring results and analyses, and (v) conclusions and recommendations.

4. In recent years, the population in Tashkent Region has increased year by year and the urban area has been expanding, so that the amount of domestic garbage has been increasing year by year. The current disposal method of domestic garbage in Tashkent is to be sent to existing informal landfills for burying. The existing irregular landfill was used from 1968 and it's 50 years so far. At present, it's proposed to build a regular landfill beside irregular landfill and the irregular landfill will be closed.

5. The project includes a dynamic Sanitary Landfill Facility (SLF) development concept approach. This utilizes the planned SLF as an immediate and effective solution for Tashkent's waste disposal challenges, with the potential to progressively expand the facility to become a disposal solution that can serve the Tashkent region over the long term. In comparison to the last submitted report here are no changes which has currently influent of the further developing of the SWMIP Project during the last time.

6. In addition, the project includes:

- ❖ purchase of garbage trucks for collection and transportation waste;
- ❖ procurement of special machines and mechanisms for the sanitary landfill;
- ❖ procurement of waste bins for WCPs and containers for transportation of solid waste;

- ❖ revamping of two transfer stations in the city of Tashkent;
- ❖ construction of 350 units of new collection points for solid waste and reconstruction of 350 units of existing collection points for solid waste;

7. Collection points will be equipped with functional and suitably sized waste bins, with provision for recyclable materials to be segregated and collected. Outdated collection vehicle fleets will be replaced with appropriately sized and highly efficient collection vehicles, dramatically reducing operation and maintenance costs. Transfer stations will be equipped with improved infrastructure and electromechanical components, and the transfer vehicles will be replaced. With these activities an improvement of the environmental impact should be also expected.

1.2. Headline Information

8. The Government of Uzbekistan (GoU) has applied for a loan from the Asian Development Bank (ADB) for the development and improvement of Solid Waste Management (SWM) system of the capital city (Tashkent). The loan reference number is L3067-UZB: Solid Waste Management Improvement Project (SWMIP). The loan was signed between the Republic of Uzbekistan and Asian Development Bank (ADB) dated 27 February 2014 and Project Agreement dated 12 March 2014 signed between ADB, Tashkent City Municipality and the State Unitary Enterprise "MAXSUSTRANS".

9. The project was prepared to impact an improved urban environment and quality of life for the residents of Tashkent. The project will develop a sanitary landfill that meets international standards, rehabilitate transfer stations, and modernize the waste collection and transfer fleet. It will build capacity in waste management and help formulate a national strategy on solid waste management.

10. The Government of Uzbekistan (GOU) seriously recognizes the need to develop and implement a national Solid Waste Management (SWM) strategy. The proposed Project will contribute to sustainable urban development in Uzbekistan by: (i) modernizing SWM to provide continuous and reliable municipal services; (ii) promoting financial sustainability of municipal services through tariff rationalization and prudent financial management; (iii) supporting policy and institutional reforms for improved sanitation and environmental management; (iv) mitigating climate change through a major reduction of GHG emissions, and through compliance with international standards on waste minimization and material recycling; and through all these measures; (v) improving livability of cities.

11. The volume of the existing dumpsite is exhausted and the original plan of the city was to extend its dumpsite operations to an adjacent lot of additional 30 hectares of area. Being fully aware of the inevitable environmental impacts through the extension of this practice, the city asked the national government for assistance in this matter. Based on these activities, the Cabinet of Ministers approved in summer 2012 the location of new dumpsite on 30 hectares of agricultural area for the utilization for waste management activities.

12. GOU has already decided to start processing land allocation of a 30-hectare land plot immediately to the south of the existing Akhangaran dumpsite (25 ha for Landfill and 5 ha for facilities), to develop this facility to a sanitary landfill facility, designed to internationally accepted standards of environmental protection.

13. Last option of expansion of landfill to the east, it has the potential for progressive expansion to become a 250-hectare long-term regional landfill, which can serve Tashkent's disposal needs for at least 50-years. In other words, this initial landfill actually is the first development phase of the much larger regional landfill, should this option be later selected by the city as the long-term disposal solution. Should the alternative long-term option be selected instead however, then this interim facility could be closed, or possibly could switch to serve the disposal needs of nearby communities. A conceptual design has been completed for the interim 25-hectare facility, which is naturally included as a component of the Project.

2. PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

14. The overall objective is to provide an improved solid waste management (SWM) system in Tashkent, the capital city, to upgrade urban infrastructure and services. The project will develop a sanitary landfill that meets international standards, rehabilitate transfer stations, and modernize the waste collection and transfer fleet. It will build capacity in waste management and help formulate a national strategy on solid waste management.

15. Given the current SWM practices, the option converting and allocating an area adjacent to the existing dumpsite to an engineered Sanitary Landfill was decided. The proposed sanitary landfill facility (SLF) concept will be based on the Best Environmental Practices (BEP) resulting to a *state-of-the-art* design consistent with international acceptable standards. This "stand alone" facility will drastically improve the SWM system (i.e. the handling and final disposal of MSW) with a possible integration capability for a long-solution to cover the entire Tashkent Oblast. The inclusion into the design of a multi-barrier system, leachate and gas collection systems will result in a significant reduction of anticipated impacts. Solid Waste Management Improvement Project (hereinafter called "Project") is to contribute to the following issues:

- Segregation of Municipal Solid Waste stream;
- Proper collection and dumping to appropriate sites
- Establishment of modern SWM systems
- Remediation of old 'truck and dump' practices in cities and regions

16. The Government of Uzbekistan has agreed for a loan from the Asian Development Bank (ADB) for the development and improvement of Solid Waste Management system of the capital city Tashkent. The Loan Agreement was signed on 27.02.2014 between the Republic of Uzbekistan and Asian Development Bank and the Project Agreement dated 12.03.2014 was signed between ADB, Tashkent City Municipality and the State Unitary Enterprise "MAXSUSTRANS". The special Decree of Uzbekistan President No.PP-2255 about the implementation of SWMIP has been issued on 31.10.2014, which specified five years project implementation period (2014-2018) and total project cost - **USD 92,25 mln.**, of which USD 69,0 mln. the loan funds from ADB and USD 23,25 mln. the contribution of SUE "Maxsustrans" and the GoU. The GoU contribution is provided as exemption of tax and customs duties in Uzbekistan for the amount of USD 5,82 mln.

17. The GoU through its Implementing Agency (IA), the State Unitary Enterprise (SUE) "MAXSUSTRANS" utilizes part of this loan proceeds towards the cost of the contract for Consulting Services related to Project Management, Implementation and Supervision, supporting the Project Implementation Unit (PIU).

18. The project was prepared to impact an improved urban environment and quality of life for the residents of Tashkent. The outcome will be improved SWM services and management in Tashkent with the following key outputs:

- i. **Output 1 - Rehabilitated and expanded solid waste management (SWM) system in Tashkent.** By the project completion it is expected that (i) rehabilitation of transfer stations and possible closure of an existing transfer station 2 (ii) 3 million tons of disposal capacity established with international environmental standards, and (iii) 1,950 tons per day of disposal and operational capacity established;
- ii. **Output 2 - Strengthened operational capacity.** By the project completion it is expected that (i) at least 90% of households actively segregating waste at source, (ii) campaign to raise awareness will reach 90% of households on waste segregation with women households members' participation, (iii) improved management and operations of Maxsustrans, including a 20% improvement (reduction) in cost per ton of waste disposal, and (iv) an IT-supported MSW collection system based on a geographic information system (GIS) database is implemented and 80% of trips monitored by the system is achieved.; and
- iii. **Output 3 - National SWM strategy.** By 2016, a draft national SWM strategy prepared and submitted to the Government and ADB.

19. There are two executing agencies (EAs) for the project – the Tashkent Municipality (Hokimiyat of Tashkent city) for the overall oversight and monitoring of Outputs 1 and 2 and State Committee of the Republic of Uzbekistan of Ecology and Environment Protection (SCEEP)¹ for execution of Output 3—the national SWM strategy. Outputs 1 and 2 will be implemented by State Unitary Enterprise "MAXSUSTRANS". A PIU was established within MAXSUSTRANS to support project implementation. This support will include project management, financial management, procurement, contract administration, safeguards implementation, construction and technical supervision, and monitoring and evaluation.

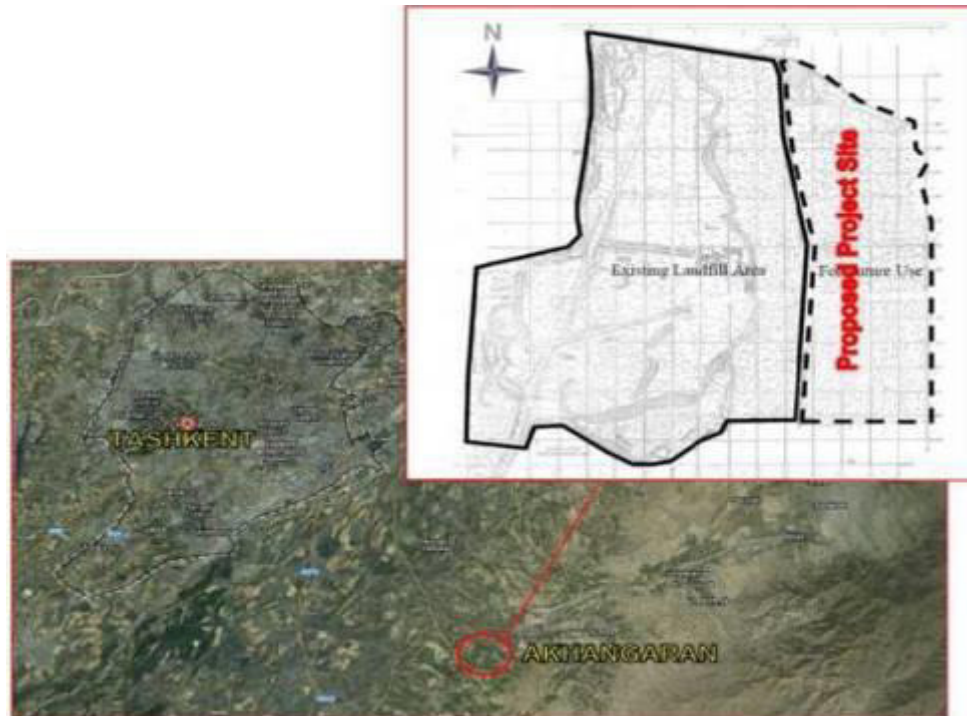
2.2. Project Site Description

20. The Akhangaran landfill is located approximately 35 km south of the center of Tashkent City in the Akhangaran district of Tashkent Province. The facility has been in use since 1967 and is currently handling the wastes collected from Tashkent city and partial from Chirchik. The proposed site for a modern Sanitary Landfill is located at the eastern side of the existing Akhangaran Landfill. The area for the Landfill including the access road will cover approximately 26.51 hectares of area which was protected against private land fond. According to the detailed design of the project in total 30.91 hectare land are required for the project.

21. Location map of Akhangaran landfill is given on **Figure 1** below.

¹ Acc. to the President Decree #UP 5024 from 21.04.2017 the State Committee of Uzbekistan for Nature Protection was renamed into the State Committee of the Republic of Uzbekistan of Ecology and Environment Protection (SCEEP)

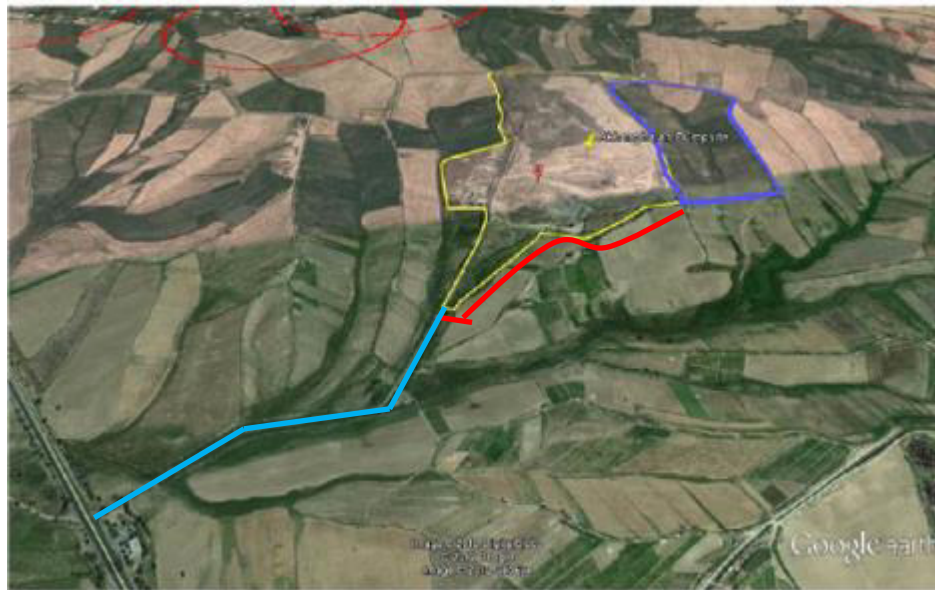
Figure 1. Location map of Akhangaran landfill



22. Access to the site: Land acquisition for the expansion of existing landfill will not be required. 1.2 ha to prolongate the access road to the new one will be compensated by the State. This is visualized below on given image as a red line (**Figure 2** below). The Access to land will be through in the first part by already functioning road to the existing dumpsite. The second section to the new SLF goes parallel with the border of the existing dumpsite. Existing access and other bypass roads should be taken in consideration for repair- and reconstructions works. Decision regarding this issue can only be done prior the construction work according to the necessity of construction technology by the Contractor.

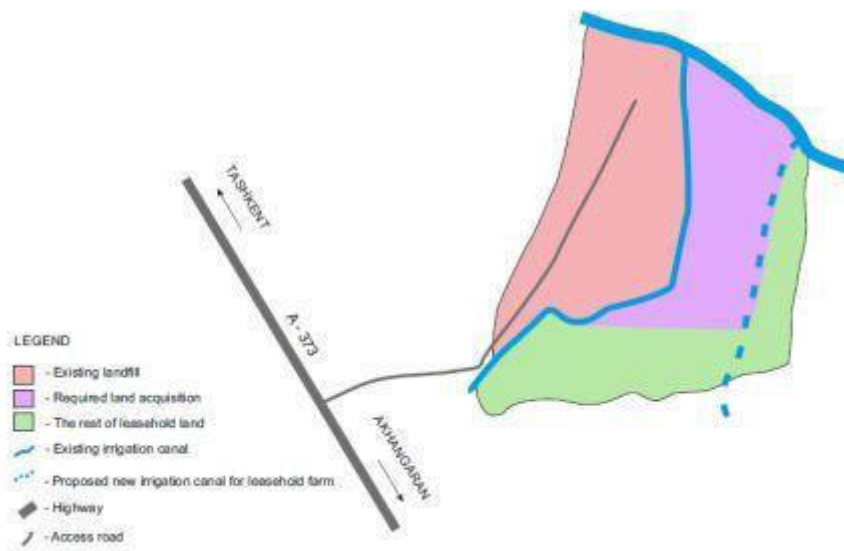
23. Buffer zone for the SLF will be within the acquired land plots.

Figure 2. Proposed Akhangaran landfill expansion



* Yellow line is border of existing landfill; blue line is border of expansion; red the access road to the new SLF; blue the existing access road (schema)

Figure 3. Map of acquired land plot and irrigation canal



24. The current situation on project implementation on land issues and compensation is the following:

- The land plot of approx. 30 ha required for the project implementation was allocated to SUE Maxsutrans according to the Decree of Hokimiyat of Akhangaran district #1536 dated August 25, 2018².
- The required land plot is now considered as construction site. In August 2018 the owner of leasehold farm, affected by the project under the LARP 2012, applied to the local authorities to return his leasehold land plot to reserve land fund of Hokimiyat without a request for compensation, (sanitary zone). The owner of the farm has stopped his farming activity at this plot.³

25. According to the mentioned Decree of Hokimiyat, SUE Maxsutrans shall:

- obtain the proper documents from local Architectural and Construction authority prior to start any design works for construction or rehabilitation on the new land;
- ensure keeping the working conditions of the existing irrigation, melioration and engineering infrastructures located in the neighboring farmer and agricultural areas;
- upon using of this land, do re-cultivation according to Regulation on land reclamation, removal, conservation and rational use of the fertile soil layer⁴.
- be aware that the allocated land shall be used within three years upon issuing this decree.

26. At present, the project implementation is on the stage of registration the documents on the land plot transferred to Maxsutrans for construction. The issues of registration of the documents shall be carried out by the specialists of cadaster department of Hokimiyat of the district / region.

27. According to the general requirements for the selection of landfill sites, the response to the site selection of this sanitary landfill is shown in Table 1 below.

Table 1: Response table of proposed site according to general requirements

| No | Requirement | Response | Remark |
|----|--|-----------|--|
| 1 | The landfill shall be set up in accordance with the overall planning for urban construction, and meet the requirements of overall planning for local urban regional environmental and the requirements of development planning | Accordant | The planning department agreed to use the land for environmental sanitation facility- [New SLF]; |

² This decree became possible upon the Decree of the President of the Republic of Uzbekistan #PP-3874 dated 19.07.2018 "About additional measures on acceleration of implementation of investment and infrastructure projects in 2018-2019".

³ On August 14, 2018, the owner of the land plot of 30 ha ("Shahboz Nuri Ziyoy") has applied to the khokimiyat of Akhangaran district and asked to accept his leasehold land plot to the reserve fund of khokimiyat. The khokimiyat of Akhangaran district issued the Decree # 1494 dated August 14, 2018 and accepted the land plot to reserve fund of lands of khokimiyat.

⁴ SCEEP, the State Committee on Land Resources, Geodesy, Cartography and the State Cadastre, and the State Inspectorate "Sanoatgeokontekhnazorat" and other authorized bodies, in accordance with their competencies, will have to ensure effective control and monitoring of quality and timeliness of work on the re-cultivation of disturbed lands and restoration of their fertility, removal, conservation and use fertile soil layer.

| | | | |
|---|---|-----------|---|
| | for local urban environmental health; | | |
| 2 | The landfill shall not affect the surrounding environment or affect the surrounding environment not exceeding current national standards. It is located in the down prevailing wind direction in summer, and is 500m away from the habitat of humans and livestock; | Accordant | There are no industrial enterprises, residential areas, water sources and key scenic spots and historical sites within 500m below and near the maximum frequency wind direction downstream; |
| 3 | The requirements for the landfill shall be consistent with the local atmospheric protection, water and soil resources protection, nature protection and ecological balance. The landfill shall be located in area with poor underground water, and shall be kept away from water sources and located in the downstream area of underground water flow direction to the greatest extent; | Accordant | The urban area is located on the side of the maximum frequency wind direction, where the underground water is less. |
| 4 | The landfill shall have a corresponding storage capacity. Its service life shall be more than 10 years. In special cases, it shall not be less than 8 years; | Accordant | After calculation, the sanitary landfill can serve for about 12 years; |
| 5 | It has convenient transportation, reasonable transportation distance, convenient water supply and power supply conditions; | Accordant | It is about 30km average away from each garbage station in the service area. The water is supplied by drilling wells, and the power supply is convenient; |
| 6 | The land acquisition cost is low and the land use value is low. | Accordant | The use value of hilly area and land is low. |

28. Thus it can be seen that the site meets the general requirements for landfills, and has good engineering conditions for water supply, power supply, road traffic and others, so the site is suitable as a construction site.

2.3. Necessity of project construction

29. The necessity of the construction of the project is mainly embodied in the following aspects:

- (1) Garbage sanitary landfills are essential as urban environmental infrastructure. If the garbage is piled up disorderly, it is difficult to match the modern city or meet the requirements of sustainable urban development. Harmless disposal of garbage is a civil project to maintain environmental health and ensure people's health.
- (2) The population of Tashkent has increased rapidly in recent years, and the daily output of garbage has reached about 1,700 tons. The existing irregular landfills have a long service life, and the storage capacity is tight. Meanwhile, the new regular landfills are about to be built and put into use, so the closure of the old landfills is imminent. This goal will also enable the execution of the President Decree of the Republic of Uzbekistan dated April 17, 2019 No. PP-4291 approving Strategy for Solid Household Waste Management in the Republic of Uzbekistan for the period 2019-2028 in the Republic of Uzbekistan for the period 2019-2028.
- (3) Tashkent has rich tourism resources such as natural and human landscapes. Its designated function is a modern ecological city with a good living environment suitable for leisure tourism. Therefore, how to effectively protect the ecological environment will become an important issue in Tashkent.
- (4) The current domestic garbage disposal facility in Tashkent is an informal landfill in the southeastern of Tashkent. The capacity of the landfill is near saturating and will be closed within the project. The closing of the old dumpsite can guarantee that the

domestic garbage generated in Tashkent is harmlessly disposed of basically to reduce its serious pollution to the environment and serious threat to soil and underground water. It is an important livelihood project to protect the landscape of Tashkent, so the project is an important infrastructure for Tashkent, and an indispensable link in the development of Tashkent.

30. In general, the domestic waste treatment facility is a major infrastructure of the city, and the closure of the existing landfill site is related to the ecological environment and sustainable development of Tashkent, as well as the vital interests of the general public. The construction of the project will create the necessary basic conditions for the development of Tashkent, and is of great significance to protect the ecological and tourism environment of the region, perfect the investment environment and improve people's living quality.

2.4. Project Contracts and Management

31. The project is being administered by the Project Implementation Unit (PIU), which is represented by the Project Director, PIU has hired "China Urban Construction Design & Research Institute Co., Ltd." (CUCD), for Sanitary Landfill Design and construction supervision of the civil works.

32. PIU Consultants (H.P. Gauff Ingenieure GmbH & Co. KG and his JV-Partner Infratech Consulting SDN Ltd (Tashkent) supporting the PIU according to the contract and its Amendment No.3.

33. PIU Consultants has National Environmental Expert – Mr. Sergey Karandayev, who implementing environmental safeguards services. He is personnel in charge of environment affairs. He is responsible for arranging on-field monitoring activities, providing inputs to this quarterly monitoring reports and making sure the protection measures are implemented accordingly.

34. The commencement means full mobilization and start with the work according to the ToR of consultants began from 14 December 2018. This consulting company will do design works of closing old landfill and establishing of new sanitary landfill. During the construction work they will supervise all construction works related to Landfill establishment.

35. The C_2 Consultant for "Sanitary Landfill design and Supervision – CUCD [China Urban Construction Design & Research Institute] is responsible to serve as the "Engineer" within the context of the Conditions of Contract (COC) and are required to nominate Resident Engineer [TMM] and other staff for the contract that are full-time resident in the area or located in the proximity of project area. Site Duties have been designated to the Resident Engineers as the "representative of the Engineer".

36. The Team Leader reports directly to the Project Director (Client's representative). The CUCD are working under the overall guidance, coordination and directions of the Project Director. Resident Engineers are coordinating with the Team. CUCD staff including the Team Leader, Office Managers and Resident Engineers mobilized during the month of December 2018 and January 2019. The balance staff of CUCD was mobilized progressively to the site.

37. The CUCD is also responsible to monitor the Environmental, Resettlement, and other social Safeguard issues of the Contract along with monitoring the Gender issues and for alleviation of grievances.

38. The tender document on selection of the contractor was approved by the Procurement Commission of Hokimiyat, Tashkent. The tender is announced. Deadline for submission of proposals was 26.11.2019. A meeting of the Procurement Commission was held in Hokimiyat of Tashkent on 10.12.2019, in which the evaluation report on the award of the contract was not approved by the Commission. The Evaluation Report has been accordingly revised and submitted again at 18.12.2019. The City Tender Commission checked again and like to get more information to the BoQ and the style of calculation. This work is under procedure to check out and to make more sufficient statements regarding this issue. The finalization of the evaluation report on the basis of the comments of the members of the City Tender Commission will be done in the beginning of 2020.

39. Main organizations involved in the project and related to environmental safeguards are presented in the **Table 2** below:

Table 2: List of contracts under the Project

| Organization | Name of main staff and Environmental Specialist | Contact data (including phone and web-site) and address of the organization | Employer | Contract Signature date | Contract Final Date |
|--|---|--|----------------------|-------------------------|---------------------|
| PIU Support Consultant – JV "H.P. Gauff Ingenieure GmbH & Co. KG-JBG and Infratech Consulting SDN Ltd." | Mr. Ingo Schoebe, Team Leader Mr. Dilshod Mavlyan-Kariev, Deputy Team Leader Mr. Sergey Karandaev, Environmental Specialist | pbox-swmpip.uzb@gauff.com eng-invest@consultant.com eng-invest@consultant.com | SUE "Maxsustrans" | 11.01.2017 | 31.12.2020 |
| Sanitary Landfill Design and Supervision Consultant -China Urban Construction Design & Research Institute Co., Ltd." | Mrs. Yuwei Xue, Authorized representative Mr. Mingtao Nie, Environmental Specialist | cucdconsulting@163.com hipmo@163.com | SUE "Maxsustrans" | 16.11. 2018 | December, 2020 |
| Capacity Development Program Consultant - JV "GWCC-INTERIVAL-UVP-Dohwa-Al Mar" | Mr. Thomas Derntl, Team Leader Mr. Thimo Fellner, Deputy Team Leader Julia Alekseeva, Environmental Specialist | thomas.derntl@gwcc.at thimo.fellner@interival.at alekseeva@almarconsulting.org | SUE "Maxsustrans" | 12.09.2017 | 31.12.2019 |

40. The role of each agency in the project is presented in the Table 3.

Table 3: Role of Agencies towards EMP Implementation

| Agency | Role |
|--|---|
| Project Implementation Unit (PIU) | <ul style="list-style-type: none"> • Holds Overall responsibility with regard to EMP Implementation • Reporting to various stakeholders (ADB, Regulatory bodies) on status of EMP Implementation • Coordinating with Environmental Experts (PIU Support Consultant, Contractors and External Monitors) • Responsible for obtaining Regulatory Clearances • Review of the progress made by Contractors • Ensure the BoQ items mentioned in EMP are executed as per contract provision |
| PIU - Support Consultant | <ul style="list-style-type: none"> • Assisting PIU in overall implementation of EMP • Review of periodic reports on EMP implementation and advising PIU in taking corrective measures • Conducting periodic field inspection of EMP implementation • Assisting PIU and reporting to various stakeholders (ADB, Regulatory bodies) on status of EMP implementation • Conduct environmental training for field officers and engineers of contractor |
| Contractor | <ul style="list-style-type: none"> • Responsible for ensuring the implementation of EMP as per provision in the document • Discussing various environmental / social issues and environmental / social mitigation, enhancement and monitoring actions with all concerned directly or indirectly • To ensure environmentally sound and safe construction practices • Conducting periodic environmental and safety training for contractor's engineer, supervisors and workers • Sensitization on social issues that may be arising during the construction stage of the project • Conduct environmental monitoring and control activities including pollution monitoring, safety; and • Preparing and submitting monthly reports to PIU on status of implementation of safeguard measures |

41. The working environment among SWMIP and Contractor has remained sound during this reporting period. Daily, weekly and regular monthly meetings are held between PIU, Maxsustrans and the Contractor (according to the necessity), and issue-based meetings are held among all parties in PIU and Employers (Maxsustrans) office with China Urban Construction Design & Research Institute Co., Ltd. (CUCD) or his local partner.

2.5. Project Activities During Current Reporting Period

42. The proposed project was estimated to cost \$92.25 million, including taxes and duties, physical and price contingencies and interest charges during implementation. Brief details are shown in the below table and project cost estimates.

Table 4: Brief details about project costs

| Source of Financing | Total (million USD) | % |
|--|------------------------|-------------|
| Asian Development Bank Financing | | |
| Loan 3067-UZB (Ordinary Capital Resources) | 69.00 | 90.79% |
| Governmental Financing | | |
| Government of Uzbekistan (GoU) | 7.00 | 9.21% |
| Total | 76.00 | 100% |

43. To be mentioned that to the Commencement Date of the Consultant the IA has arranged the following procurement packages:

1) Containers for collection of SDW at WCP (Package G-3)

(SUE /Maxsustrans/CB-G_3-2016-02)& (SUE /Maxsustrans/DC-G_4-2017)

44. It's done, package procured.

2) Construction / reconstruction of new waste collection points (Package CW-5)

(SUE /Maxsustrans/CB-W5)

45. It's done, package procured.

3) Waste Collection & Transfer Trucks (Package G-2)

(SUE /Maxsustrans/CB-G2-2016-02)

46. It's done, package procured.

47. *Note:* In accordance with the protocol instructions of the Administration of the President of the Republic of Uzbekistan dated February 13, 2018. No. 2207-xx, the Cabinet of Ministers dated 01/23/2018. No. 01-21 / 1-116 and dated December 26, 2018, it was entrusted to purchase an additional number of garbage trucks in the amount of 59 units due to the savings. Projected cost of \$ 4.2 million are included in the project components and agreed with ADB and the Ministry of Finance. Tender documents have been purchased, submitted offers are evaluated, and final report submitted to the City Tender commission for final confirmation. The Project is still in progress.

4) Consultant for support of PIU in project implementation (Package C1)

(SUE /Maxsustrans/QCBS-C1-2016-01)

48. The contract is concluded between SUE "Maxsustrans" and JV "H.P. Gauff Ingenieure GmbH & Co. KG-JBG" (Germany) and LLC "Infratech Consulting SDN" (Uzbekistan). The Consultant has started the activity since 01.08.2017 and continues the activity. Services of the Consultant are rendered till December 31, 2020. By today, the Consultant estimated competitive proposals and submitted estimated reports on purchasing G_6 packages (purchase the garbage trucks), G_1 (purchase of special equipment and mechanisms for new solid waste landfill) and W_1 (construction of new solid waste landfill and closing of an old dump) for ADB consideration.

5) Consultant for support of capacity of SUE "Maxsustrans" and development of National Strategy for Solid Waste Management of the Republic of Uzbekistan (Package C3)

(SUE/Maxsustrans/QCBS-C3)

49. For the present, the contract is signed with JV "GWCC-INTERVAL ZT GmbH" (Austria), UVP Environmental Management and Engineering GmbH (Austria), Dohwa Engineering Co., Ltd. (Korea) and LLC "Al Mar Consulting" (Uzbekistan). The Consultant has started the activity since 15.02.2018 and finished the activity on December 31, 2020.

6) Consultant for Sanitary Landfill Design and Supervision Consultants (C2) of new landfill and closure of old landfill

(SUE/Maxsustrans/QCBS-C2)

50. The Contract has been signed on 16.11.2018. The commencement date was 14.12.2019 when the Company China Urban Construction & Research Institute Co. Ltd. has started their work.

51. The design and supervision will be conducted in two separate phases. It was planned that the design phase of 6 months and supervision phase of 18 months. Consultant's services are provided until December 2020.

52. Middle of August the Consultant has submitted the final design documentation for the construction of a new solid waste landfill on 30 hectares and the closure of the old landfill on 59 hectares, which is currently approved by the state examination bodies.

53. Design Basis

- (1) Topographic map of the proposed site to prepare;
- (2) Feasibility study report of the project;
- (3) Geological survey report of the project location;
- (4) Hydrogeological survey report of the project site
- (5) Project assignment

2.6. Description of benefit of the final Project Design

54. CUCD designed following New Sanitary Landfill with following main data:

- 24,62 ha for the clean storing of solid waste
- Expected life time based on current and delivering quantities in the future by approximately 12 years. TOR requested minimum 10 years.
- Optimized liner system to reduce the thickness for more waste space
- Enlargement of the depth
- Using a PS for leachate collection, pump sump below the surface (-20m)
- Max. height by 30 m over ground
- Part of the top soil and other excavation material will be used for closure of the old landfill
- For emergency cases (fire) in the new Landfill
- intermediate cover of sections for the new Landfill according to the operational plan

55. These variant gives the best impute for an ecological protection and increasing of the life time of the new landfill.

2.7. Description of Any Changes to Agreed Construction methods

55. Not applicable.

3. ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1. General Description of Environmental Safeguard Activities

56. IEE for project was prepared for SUE Maxsustrans in May 2013 and it was published on ADB's website.

57. The IEE report covers the general environmental profile of the project and includes an overview of the potential environmental impacts and their magnitude on physical, ecological, economic, and social and cultural resources within the subproject's influence area during design, construction, and operation stages. Additionally, National Environmental Expert has reviewed this Environmental Management Plan (EMP) as part of this report (**Annex 1**). The level of details and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

58. Specific Tasks for the Sanitary Landfill Design and Supervision Consultant, according to Contract No. SUE/Maxsustrans/QCBS-Cons_2 are:

Phase I – Detailed Engineering Design

59. As already mentioned in the last report (valid for C2 Consultant)

- i. to provide a detailed description of the scope of construction and installation works and make up a calculation of "Initial cost estimate of construction at current prices" as cost estimation as part of the Detail Design, BoQ etc. together with the preparation of the Bidding documents together with the C_1 Consultant.;
- ii. to provide a technological scheme for operating the new landfill, and also to develop the necessary measures for the period after the closure of the landfill and its handover for further use;
- iii. to obtain a positive conclusion from the state expertise of the authorized body of the Republic of Uzbekistan on design documentation for construction of the new landfill and closure of the existing dumpsite. If necessary, SUE "Maxsustrans" should assist the Consultant in obtaining approval from the state bodies and organizations for conducting detailed design and during it;
- iv. to support SUE "Maxsustrans" and PIU in general management and implementation of the Civil Works contract, including coordination of activities, monitoring, record keeping, certification of contractor's work and reporting on work progress.

Phase II – Supervision of Construction Works

- i. to be responsible for supervision of the new landfill construction and closure of the existing dumpsite, including regular supervision over contractors, performed works quality, installation of equipment, deadlines and costs from start to completion;
- ii. to ensure that construction works are carried out in accordance with international and national standards, technical specifications and approved design documents;
- iii. to ensure that construction is carried out by the contractor in accordance with environmental and social norms and regulations of Uzbekistan and Safeguard Policy of ADB;
- iv. to carry out planning and analysis of the final commissioning tests conducted at the completion of each section of works;

- v. to carry out planning of monitoring activities to be performed during the Defects Liability Period and advising SUE "Maxsustrans" and PIU at issuing the Works Completion Certificate;
- vi. to advise the SUE "Maxsustrans" and PIU on all matters relating to construction of the new landfill and closure of the existing dumpsite;
- vii. to prepare documents and regular reports for SUE "Maxsustrans" and PIU as per TOR;
- viii. to evaluate the quantity and value of the completed works as well as payments to the Contractors;
- ix. to ensure implementation of Quality Assurance Plan, Environmental Monitoring Program, Occupational Safety Plan on works site of the Contractors;
- x. to communicate and support SUE "Maxsustrans" and PIU if any changes or deviations from the originally approved design during the Works;
- xi. to conduct an Initial Environmental Evaluation (IEE), an Environmental Impact Assessment (EIA), an Environmental Management Plan (EMP) and an Resettlement Program / Social Impact Assessment (RP / SIA) program. The Consultant should submit an EIA for review and approval by SCEEP and receive a positive opinion;
- xii. to submit the results of the discussion of policy measures, laws, regulations, standards and guidelines that directly apply or relate to the environmental and social issues of the Project at the national and local level and taking into account ADB requirements. When analyzing the impact, it is necessary to consider all potential environmental impacts and risks of the project. The analysis should cover both unfavorable and favorable consequences of the project. The Consultant should also conduct an analysis of the possibility that specific individuals or groups of individuals may be affected unequally or disproportionately by the potentially harmful environmental impact of the project because of their poorly protected or socially vulnerable status. The EMP should identify desirable outcomes and actions to address issues related to identified impacts and risks, and to ensure compliance with existing requirements as measurable events. Also, the Consultant should consider information disclosure measures, a mechanism for reviewing and responding to complaints, and a process of ongoing consultation with affected individuals and with their participation during the implementation of the project. Consultations should include the conduct of substantive consultations with persons affected by the project and other relevant parties, including civil society, and facilitating their informed participation.

60. The technical route of new landfill project is as follows:

- 1) The type of the domestic garbage sanitary landfill: **"Valley Landfill"**
The construction site of the project is a valley, so it is designed according to the design method for valley landfills.
- 2) Domestic garbage disposal process: **"Improved Anaerobic Landfill Process"**
The landfill uses an improved anaerobic landfill process to make corresponding engineering design, and set up a bottom impermeable system, a leachate collection system, and a landfill gases drainage system, so as to facilitate the operations and standardized management of sanitary landfill.
- 3) Landfill operation process: **"Sanitary Landfill Operation"**
Domestic garbage in the sanitary landfill needs to be dumped, paved, compacted, covered and disinfected in accordance with certain procedures to reduce or eliminate the impact of domestic garbage on the surrounding environment.

61. Entry requirements for domestic garbage sanitary landfill: the waste entering the domestic garbage sanitary landfill shall be domestic garbage. It is strictly forbidden to mix domestic garbage with the following materials to enter the domestic garbage sanitary landfill:

- ❖ Toxic industrial products and their residues;
- ❖ Toxic reagents and medicines;
- ❖ Substances that have chemical reactions and produce harmful substances;
- ❖ Corrosive or radioactive materials;
- ❖ Dangerous goods such as flammables and explosives;
- ❖ Biohazards and hospital waste;
- ❖ Other substances that seriously pollute the environment.

62. In order to ensure that the above substances do not enter the landfill area, sampling inspection of the incoming garbage shall be organized regularly by the operating company.

3.2 Site Audits

63. The environmental safeguard consultant, NIE Mingtao of CUCD, was fielded in Tashkent through 17-27 May 2019. The main purpose of this field work is to prepare the initial environmental examination (IEE). The environmental safeguard consultant visited the project sites; attended various meetings with the project proponents (Maxsustrans and Waste Disposal and Utilization), CUCD team's project management and design staffs, local design/geological/hydraulic survey institutes (TMM and its subcontractors), PIU consultant (Gauff) and the capacity building consultant environmental specialist; and prepared relevant documents.

| Findings | Implementation status | Responsible organization/person | Comment |
|---|---|--|--|
| <p>Main observations at site visit.</p> <p><i>The current Akhangaran dump site was not well managed and maintained, ie, obvious fire/smoke posed health and safety threats to the dumpsite operational staff/waste pickers. One of the main reasons is that no heavy landfill equipment for compaction and proper leveling and storing is available. Mostly all previous equipment was damaged.</i></p> <p><i>The natural terrain of new landfill looked fit for landfill siting, where without planting crop was observed. Some sections of the irrigation channels located in the east of the old dumpsite seemed being damaged with leakage risk to pollute surrounding wheat farmland.</i></p> <p><i>As associated facilities to CUCD work scope, generally the waste collection points were managed well, however, Yunusobod transfer station lacked of</i></p> | <p>The design of building new landfill and closing existing dumpsite has been finished. The procurement of civil works is ongoing. And the civil works is expected to start in Q2 2020.</p> <p>Leakage prevention measures (HDPE lining) are included in the project design.</p> <p>Waste transfer facilities are suggested to upgrade concurrently with the whole project.</p> | <p>Maxsustrans, PIU Support Consultant, Sanitary Landfill Design and Supervision Consultant (CUCD)</p> | <p>The project implementation progress to be closely monitored in next reporting period.</p> |

| | | | |
|--|---|---|---|
| dust/odor/leachate mitigation facilities and basic personal protection equipment (PEE) such as mask in place. | | | |
| ToR scoping. The ToR between the client (Maxsustrans) and CUCD requires to conduct an Initial Environmental Evaluation (IEE), an Environmental Impact Assessment (EIA), an Environmental Management Plan (EMP) and The Consultant should submit an EIA for review and approval by SCENP and receive a positive opinion. However, the whole project including the proposed landfill and closure of dumpsite is classified as category B according to ADB SPS (2009), as such, only IEE and EMP are applicable, whilst EIA is not relevant to this project in terms of ADB's requirements. | The IEE was approved by ADB in 2013. And the EMP was prepared also is attached to the bidding documents. | Maxsustrans, PIU Support Consultant, Sanitary Landfill Design and Supervision Consultant (CUCD) | Necessary to ensure the EMP as part of construction contract with contractor(s). |
| Domestic EIA of the whole ADB project. Domestic EIA approval should be sought prior to construction commences according to UZB's national requirements. The loan agreement also stipulates that "The Borrower shall ensure that Maxsustrans shall not award any Works contract which involves environmental impacts until: (i) SCNP has issued a statement of ecological expertise; and (ii)..." Although during this field work, CUCD received a copy of the domestic EIA dated 2013, it is still unclear whether the domestic EIA has been approved by the authority or not. | Under discussion. | Maxsustrans | Suggest to follow up this issue in next reporting period. |
| Baseline data arrangement. Through discussions with various parties, underground/surface water quality will be provided by TMM's hydrological survey subcontractor; and brief soil chemical composition analysis by TMM's geological survey subcontractor. | The geohydrology survey institute provided data including underground water quality test results. However, no surface water quality test on the irrigation channel or soil quality is available so far. The monitoring | Maxsustrans, prospective contractor(s) | Suggest to follow up the environmental testing data upon the construction contract is signed. |

| | | | |
|--|--|--|--|
| | requirements have been incorporated in the EMP as part of BD. | | |
| Information disclosure arrangement. Based on CUCD's suggestion, Maxsustrans principally supported to disclose the brief introduction of IEE upon it is finished through Maxsustrans/government website. | The current IEE (approved by ADB in 2013) is in English. This issue is under discussion. | Maxsustrans, PIU Support Consultant, Sanitary Landfill Design and Supervision Consultant(CUCD) | Suggest to follow up this issue in next reporting period. (Two potential options: translation of the 2013 IEE into Russian for local people/main stakeholders' access; or usage of the domestic EIA document in Russian dated 2013.). |
| Public consultation arrangement. CUCD including the environmental safeguard consultant discussed with Maxsustrans the public consultation arrangement on basis of initial stakeholder analysis. Based on Maxsustrans' requirement, CUCD submitted a formal request in that such public consultation by foreigners should be approved by the Regional Municipal Government in advance. | This issue is under discussion. | Maxsustrans, PIU Support Consultant, Sanitary Landfill Design and Supervision Consultant(CUCD) | Suggest to follow up this issue in next reporting period. (one option could be that CUCD design the public consultation scheme and develop report(s), while leaving the PIU as local proponent to implement it) |
| International standard landfill and closure of dumpsite. The environmental safeguard consultant preliminarily discussed with the CUCD design staff and prepared tables to compare with generally accepted international standards for environmental, health and safety (EHS) and landfill design | This has been discussed in the CUCD team internally. Basically, the project design complies with the relevant international standards. | Maxsustrans, PIU Support Consultant, Sanitary Landfill Design and Supervision Consultant(CUCD) | Suggest to keep following up this issue in next reporting period. |

64. Visual observations and photographs were obtained during the field visit. Key findings were discussed with the concerned engineering staff.

65. In general, it was concluded that the project construction activities will not cause any significant and irreversible environmental impacts during construction. Wherever environmental issues would observed during the visits by the CUCD Consultant, they will be brought to the notice of the PIU for ensuring implementation of necessary corrective measures by the Contractor.

66. The PIU Consultants conducted inspection of the Project sites with environmental relevance during reporting period on 19-20 August 2019 and 11-12 November 2019.

67. It was revealed that the pollution sources in this project mainly include the following aspects:

- (1) Atmospheric pollutants: Atmospheric pollutants mainly refer to the landfill gas in the landfill zone, the main components are CH₄, CO₂, NH₃, etc.
- (2) Sewage: The sewage in the site mainly comes from the landfill leachate, as well as the vehicle flushing sewage.
- (3) Noise: The noise mainly comes from the mechanical working noise in the landfill.
- (4) Odor: Odor pollution comes from garbage itself, landfill leachate and landfill gas (2 etc.).

3.2.1 ADB Missions

68. ADB mission took place from 03-20 September 2019. This mission visited Uzbekistan to undertake:

- ❖ UZB: Proposed Suitable Solid Waste Management Project (SSWMP) – prepare the draft report and recommendation of the President (RRP) and all other required project documents targeting for circulation on 29 September 2019; and
- ❖ L3067-UZB: Solid Waste Management Improvement Project (SSWMIP) –
 - ❖ (i) review overall progress of the project implementation;
 - ❖ (ii) identify issues and constraints encountered in project implementation, and
 - ❖ (iii) recommend measures on overcoming deficiencies and catching up disbursement projections.

69. The second ADB mission took place from 26 November – 03 December 2019 and this mission had the aim:

- ❖ L3064 UZB: MFF Water Supply and Sanitation Services Improvement Program – Tranche 4 assess:
 - ❖ (i) the achievements of project outputs, outcome and impact;
 - ❖ (ii) the performance of the Borrower, the executing agency, contractors and consultants; and
 - ❖ (iii) project performance and compliance with loan covenants, compliance with ADB's procurement, disbursement, financial management and safeguards requirements and procedures; and
- ❖ L3067-UZB: Solid Waste Management Improvement Project (SSWMIP) –
 - ❖ (i) follow up the executing agency on the awarding of three critical goods and civil works contract packages;
 - ❖ (ii) work with "Maxsustrans" and Project Implementation Unit to ensure timely submission of the withdrawal applications; and
 - ❖ (iii) ensure the environmental protection measures are in place prior to the commencement of the civil works in Q1 2020; and
- ❖ Proposed Water and Sanitation Sector Development Program: discuss with the government the proposed project financing modality and the proposed loan and Transaction Related Technical assistance (TRTA) scope.

3.2.2 Issues Tracking (Based on Non-Conformance Notices)

70. Not yet applicable.

3.2.3 Trends

71. Not yet applicable.

3.2.4 Unanticipated Environmental Impacts or Risks

72. Not yet applicable.

4. RESULTS OF ENVIRONMENTAL MONITORING

4.1. Overview of Monitoring Conducted during Current Period

73. Initial Environmental Examination (IEE) report designed for all phases (design, construction and operation) for SWMIP was prepared in 2013. However, this 'Environmental Monitoring Report' covers only the design phase impact monitoring, as there is no any construction activity.

74. Current Situation: No significant environmental issues were flagged and no complaints received from the local residents and no adverse impacts occurred as a result of no construction activities during the reporting period.

75. Within the reporting period, Team Leader and Local Environment Specialist of PIU Support Consultant, International Environment Specialist of the Sanitary Landfill Design and Supervision Consultant have inspected the Akhangaran landfill. During the inspection, overall methodology to assess and monitor EMP implementation for future construction activity was conducted. Several on-going works were reviewed and meetings to validate environmental performances by International Environment Specialist.

76. Most of the environmental monitoring requirements are for the construction period of project site. At the construction stage, the SWMIP site engineer is responsible for the preparation and submission of monthly environmental supervision reports. Meanwhile, the PIU is responsible for the monitoring of environmental parameters and preparing environmental results reports. The Environmental Expert of PIU is responsible for compiling the Bi-annual environmental monitoring reports.

77. Monitoring and reporting of the project will be conducted prior to construction, during construction, and during operation. The PIU shall monitor the performance and implementation of the EMPs. Monitoring reports on the performance and in implementing the EMPs, shall be prepared prior to construction (detailed engineering design and procurement stages), during construction and during project operation, as follows: i) monthly progress reports; and ii) quarterly monitoring reports to be submitted to ADB. The monitoring report/s shall also document the relevant environmental aspect and its respective mitigation measure, as well as grievances received and resolved, if any.

78. Prior to commencement of any construction work, contractors has to submit an EMP and compliance report to PIU ensuring that all identified impacts detailed in the environmental assessment have been undertaken. The PIU will review reports submitted by CC as soon as construction works commence.

79. The PIU supposed to organize an induction training to discuss the submitted CEMP including environmental monitoring requirements and reporting of unexpected adverse impacts or impractical mitigating measures observed during the construction phase.

80. Based on monthly reports and measurements, the PIU will draft quarterly EMP implementation report which will include

- (i) construction activities over the last 3 months;
- (ii) reporting on EMP implementation;
- (iii) sampling results
- (iv) findings on the compliance status;
- (v) summary of any non-compliance and remedial actions taken; and
- (vi) recommendations for improvement, revision of the mitigation measures and/ or the EMP if any. The safeguard specialist of the PIU will review the draft EMP implementation report which upon approval by the Project Director will be submitted to ADB. Depending on findings, future modifications in the EMP could be undertaken with the concurrence of the ADB. These will be generally undertaken, if required, upon review of the EMP progress reports submitted by the PIU to ADB for review and further action.

81. The IEE goal was to maximize the use of available secondary data (without baseline instrumental measurements) in the understanding of the present condition of the project site. It should be noted that secondary information made available by pertinent governmental agencies and secondary literature was maximized to establish the baseline for the site. IEE described the baseline environmental conditions, including physical, ecological and socio-economic resources in project site, assesses environmental impacts of the intended project activity, and provides remedial/mitigation measures. The baseline parameters would be established prior to construction for monitoring the situations of environment affected during construction. The baseline measurements will become the conditions against which any changes due to project effects will be measured. All data must be collected so that their source can be traced by anyone who picks up the document.

82. The operation management of domestic garbage treatment facilities involves many aspects, and environmental monitoring is one of the important links of operation management. It is an important mark of the standardized operation management of domestic waste sanitary landfills. Environmental monitoring is the evaluation level of the operation status of domestic waste treatment facilities. Environmental monitoring involves all environmental factors such as atmosphere, groundwater, sewage, leachate, noise, biogas and various pollutants, which can fully reflect the environmental situation. The environmental monitoring project of domestic waste treatment facilities must be carried out periodically and in stages according to standards. The main environmental monitoring projects are shown in Table 5.

83. In accordance with the geographical environment and characteristics of the project, the existing monitoring department of SCEEP can be responsible for the environmental management and monitoring. At this stage, the background values of the site environment shall be tested and investigated immediately.

(1) Background environmental monitoring of the site

84. Before the domestic garbage sanitary landfill is put into operation, the environmental protection department and the Sanitation and Anti-epidemic Station shall carry out background monitoring for various environmental and microbial indicators, as well as the groundwater and surface water, and put them into the archives.

(2) Environmental quality monitoring of the site

85. To ensure that the anticipated environmental protection objectives are achieved, a sound environmental monitoring system shall be established and improved at the site.

Table 5. Environmental monitoring item table

| Monitoring item | | Note (see also paragraph 88 etc.) |
|--------------------------------|---|---|
| Surface water | pH、SS、DO、BOD5、COD cr、NH3-N、NO2-N、NO3-N、CL-、TP etc. | Three background monitoring shall be conducted for the landfill, once in dry season, flood season and normal season, and twice in peak month. |
| Groundwater | 13 items of PH, total hardness, chloride, COD, ammonia nitrogen, volatile phenol, cyanide, Escherichia coli, etc. Water level shall be monitored at the same time | The monitoring wells shall be cleaned three days before sampling. The amount of water taken out during well washing is 3-5 times the amount of water stored in the wells, and the monitoring indicators will be adjusted when necessary. The monitoring points are groundwater monitoring wells and domestic water wells. It shall be monitored three times a year, the sampling time is in April, August and November, respectively. |
| Leachate | SS、COD、BOD5、NH4-N、coliform value | Monitoring points are: leachate collection wells, leachate treatment facilities outlet. It shall be monitored three times a year, the sampling time is in April, August and November, respectively. |
| Atmosphere | TSP, odor intensity, ammonia, hydrogen sulfide, methyl mercaptan | There is a monitoring point in both upper and lower wind directions. When the wind direction is not fixed, the monitoring point can be increased appropriately. It shall be monitored twice a year, the sampling time is in April and August, respectively. |
| Landfill gas | CH4、CO2、CO、N2、O2、H2、H2S | The monitoring point is the methane collection orifice, which can monitor one point. It shall be monitored once a year in August. |
| Fly breeding monitoring | Field boundary noise | Within 1~3 years after the landfill is opened, it shall be monitored 4 times a year, preferably in July ~ December |
| Noise | Field boundary noise | |

Figure 4 Environment monitoring locations during construction

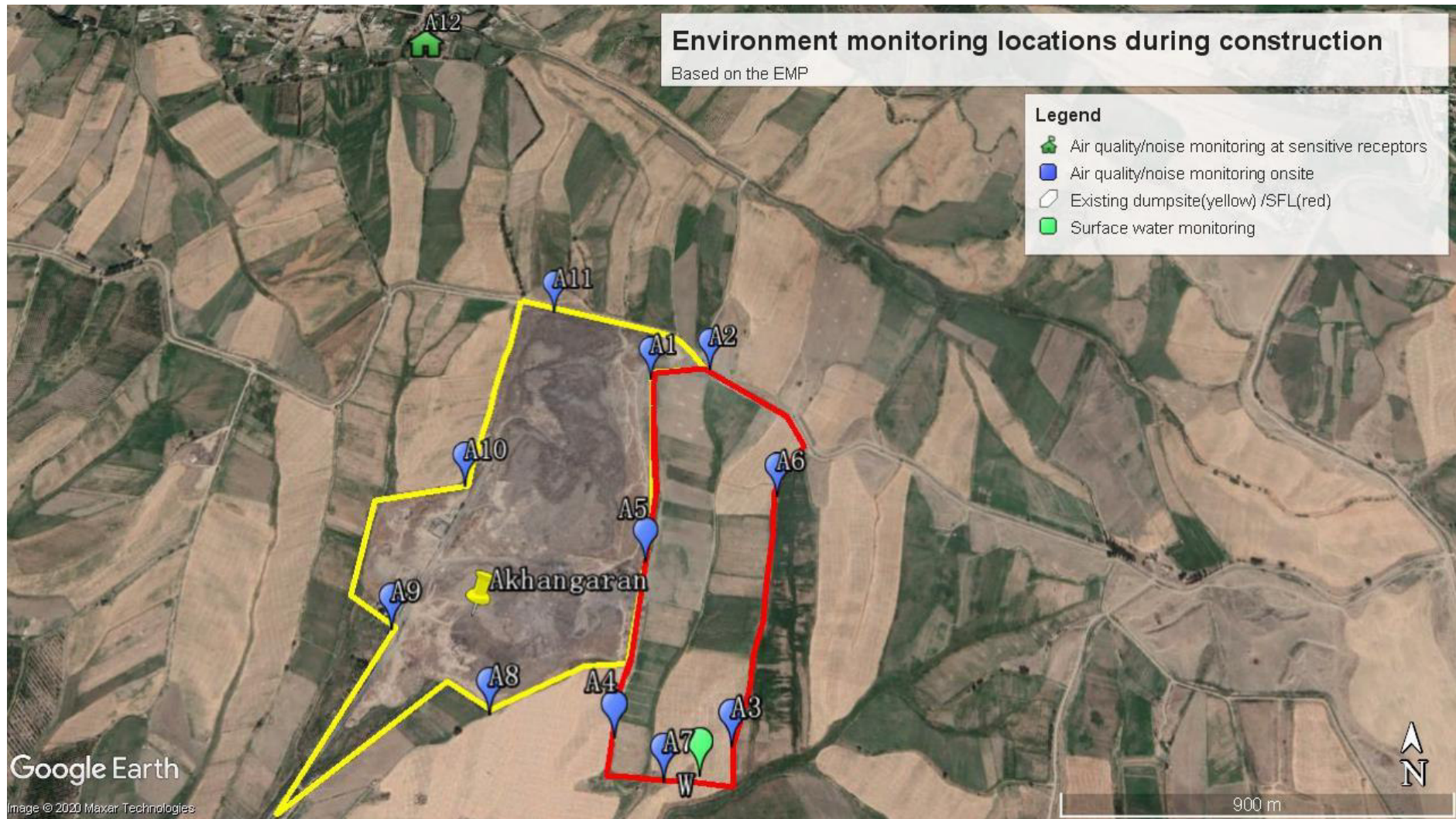
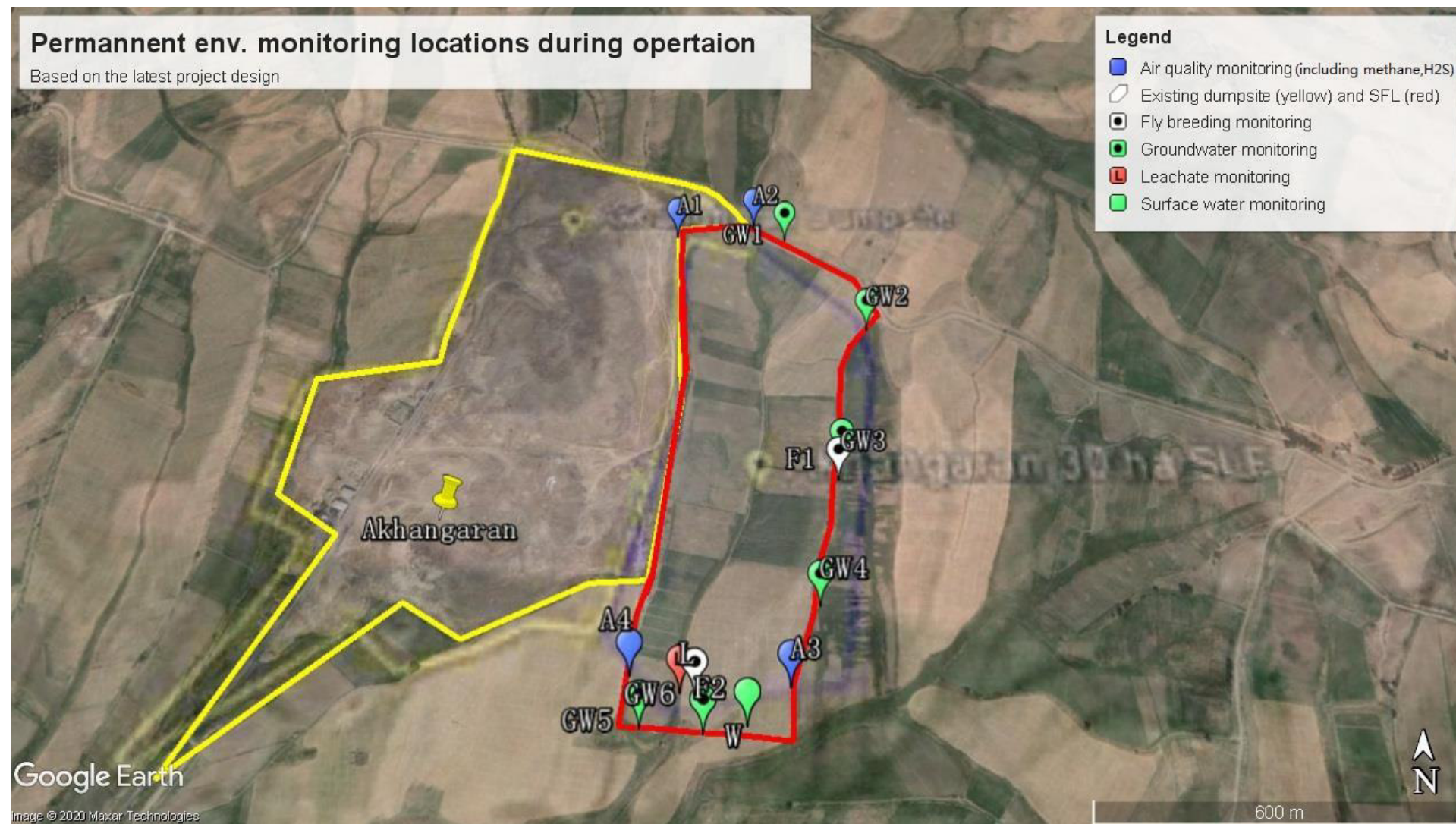


Figure 5 Permanent environment monitoring locations during operation



(3) Monitoring institution, personnel

86. According to the needs of the project, the existing environmental protection institution can be responsible for the environmental management and monitoring of the plant, and the full-time environmental supervisor shall be equipped to be responsible for the environmental quality management of the landfill and the entire plant.

(4) Monitoring content and distribution

87. Monitoring of surface water around the site

(i) Sampling point layout

Three points are laid in the landfill zone.

(ii) Water sample collection

88. Instantaneous sampling shall be the main method, and the sampling tool for the water sample at the horizontal point can be determined according to the specific project; the vertical point water sample at the seepage layer shall be collected by the vertical water collector. The sampling frequency is: the background monitoring can be sampled 3 times; in the first year after the landfill is opened, the dry season, the flood season and the normal season are sampled one time, and the dry season and the flood season in the second year are sampled one time.

1) Groundwater monitoring

(i) Monitoring well setting

There are six groundwater monitoring wells in the landfill, which are:

One background well, which is set at 20m upstream of groundwater flow in slag yard.

Two contaminated diffusion wells, which are set at 50m on each side of the vertical trend of groundwater respectively.

Two pollution monitoring wells, which are set at 30m and 50m downstream of groundwater flow in slag yard respectively.

One leachate monitoring well, which is set at the outlet of the leachate pipeline.

The borehole diameter of the monitoring well is not less than $\Phi 110\text{mm}$.

Before the slag yard is put into use, the groundwater background quality shall be monitored; when the slag yard is put into use, the groundwater shall be monitored continuously until the concentration of sewage pollutants produced by the slag yard is lower than the corresponding limit for two consecutive years.

The groundwater monitoring indicators include pH, total hardness, total dissolved solids, permanganate index, ammonia nitrogen, nitrate, nitrite, sulfate, chloride, volatile phenols, cyanide, arsenic, mercury, hexavalent chromium, lead, fluoride, cadmium, iron, manganese, copper, zinc and fecal coliform.

(ii) Sampling method

Pump the well water 1~3 times to clean the sampler.

(iii) Sampling frequency

According to the actual situation, it is not less than once a year in flood season, normal season and dry season.

2) Atmospheric monitoring of the site

(i) Sampling point layout

One point is arranged in the upper wind direction of the site, and one point is arranged in the downwind wind direction of the site; three points are arranged in the site. The gas-conducting system is arranged at the outer discharge port.

(ii) Atmospheric sampling

Sampling frequency is: background monitoring gas-collection once before landfill, continuous monitoring after start-up, CO and CH₄ monitoring once a month.

3) Soil monitoring

(i) Sampling point layout

Shallow-layer layout: Arrange several sampling points at the surface of the landfill at 15~20cm. Deep-layer layout: Take 1 mixed sample at the filling depth of 2m as point 1, and determine the number of sampling points according to the difference of depth.

(ii) Soil sampling

After arranging several points on the surface soil according to diagonal method, plum blossom method, chessboard method and meandering method, the topsoil of 15cm is excavated with a small shovel at each point, and then 1000g soil sample is taken at each point; the deep soil shall be sampled by empty pipe dry drilling, and a 1000g mixed sample is taken every 2m. The sampling frequency is: in the background monitoring before landfill, the topsoil shall be taken as the background value once; after the landfill, the deep waste samples shall be drilled once a year, and a mixed sample shall be taken at a depth of 2m.

4) Gas production monitoring of the landfill

(i) Sampling point layout

The outward discharge port of the gas-conducting system shall be taken as the sampling point.

(ii) Atmospheric sampling

Sampling shall be carried out using airbags or air pockets. If it cannot be sampled by natural methods, it can be pumped out; the sampling frequency is continuous monitoring. When it is necessary to make CH₄ curve, it shall be sampled once a month.

5) Leachate monitoring

(i) Sampling point layout

Leachate sampling points are set in each monitoring well.

(ii) Leachate sampling

A rigid plastic bucket shall be used as the water extractor. Pumps shall not be used to pump water. Each time, 500~1000 ml of water shall be taken. The sampling frequency is: once a month after the landfill is opened, and after the second year, it shall be sampled every quarter and continuously monitored.

6) Landfill gas monitoring

89. In addition to the above sampling monitoring projects, key online monitoring of some projects is implemented, including methane concentration.

4.2 Guiding ideologies for design

90. For the actual situation of the project, a reasonable project implementation plan was selected according to local conditions.

91. In the design process, according to the actual situation of the project, priority was given to the equipment with mature technology, high efficiency, low energy consumption and reliable operation, and the combination of technological advancement, process feasibility and economy shall be adhered to.

92. Drawing lessons from and referring to advanced technologies and experience, make a feasible technological process practically, continuously use new technologies and equipment, and improve domestic garbage disposal facilities, so as to provide reliable technical and equipment guarantee for the sustainable development of environmental sanitation in Tashkent.

93. In the principle of overall planning, phased implementation and maximum sustainable development, for the purpose of considering the economy of the project, striving to achieve the maximum environmental benefits, and achieving the coordination between the project and urban construction development, the main ideology is as follows.

1. Combining global science and technology, use advanced, mature and reliable processes to make the overall level of the sanitary landfill meet the construction requirements;
2. Persist in adjusting measures to local conditions practically to achieve the unity of environmental, social and economic benefits of the project;
3. Fully embody the concept of sustainable development and the harmony between human beings and the nature, and insist on the principle of coordination of economic and social development and ecological construction;
4. Ensure the environmental protection and reliability of the system, the economy and rationality of management, and the advancement of technology;
5. The project is in line with the principle of Three Simultaneities, a reasonable construction implementation plan is adopted, and the feasibility, economy and rationality of the project implementation are fully considered;

4.3 Environmental protection measures during design stage

(1) Coverage

94. Coverage operation is an important part of landfill operations, which play an extremely important role in the surrounding ecology and the working environment of workers. The site is located in an environmentally sensitive area, and garbage coverage is not only the requirement of landfill operation process, but also the need to protect the surrounding ecological environment and improve the living environment of the surrounding residents. Therefore, in this project, the actual situation of the landfill and the surrounding area is combined, so that the coverage and final coverage of the landfill operation are designed in more detail.

95. The coverage is usually divided into daily coverage, intermediate coverage and final coverage. Daily coverage is timely coverage after daily landfill operation. Clay or HDPE membrane with a certain thickness can be used as the coverage material. Temporary coverage material can be used to cover the slope of landfill garbage the next day, and then the landfill operation will continue after uncovering the coverage material the next day. The intermediate coverage refers to the surface coverage of the garbage after the landfill heap

has reached a certain height (generally 5 meters), and the coverage material is generally HDPE membrane. The final coverage refers to the surface coverage of the garbage landfilled to the design elevation. The coverage material is usually natural soil, the thickness shall be according to the requirements of the closure design, usually about 1 meter. HDPE membrane can also be used to cover the closure.

96. The coverage material can be determined according to the process requirements and local conditions. In general, poorly permeable clay or other synthetic materials are selected. According to the actual international use situation of the current garbage dump operation, the following coverage scheme is recommended.

97. During the operation of this landfill, 0.5mm HDPE membrane is used to replace the clay for daily coverage and temporary coverage of permanent slope. HDPE membrane is used for intermediate coverage, which combines with leachate, odor and fly control in operation.

(5) Fly eradication

98. Flies are important pollutants in landfills, which have a great impact on the surrounding environment of the landfills. 0.5mm thick HDPE membrane may be combined with landfill operation process to eradicate the flies. Excavated material can be used as well but it will reduce the capacity of the landfill.

99. Systematic fly eradication in landfills requires the following steps:

- 1) Garbage collection and transportation in landfills is treated in a sealed way, which can not only prevent adult flies from breeding, but also kill fly maggots.
- 2) Landfill operations are arranged in a reasonable way, which can reduce the exposed area, increase the compaction density of garbage, and control odor and fly breeding.
- 3) Regularly eliminate flies by drugs and alternate medication is adopted. The adult flies are killed directly to control the density of the adult flies.

100. The fly eradication design in the above steps is to change the environmental conditions of the fly and prevent its growth to achieve the fly eradication.

(3) Control of dust float

101. Fly dust and floating materials mainly come from waste paper, dust, plastics and other light materials that can be blown by the wind in the landfill. The following methods are proposed to control the fly dust and floating materials.

- 1) All vehicles used to transport garbage in the site are sealed vehicles;
- 2) Clean vehicles are equipped, and regular cleaning measures are taken for public roads;
- 3) The operation surface in the landfill is covered in time;
- 4) Both the temporary closure and the final closure shall be covered in time;
- 5) In the case of strong winds, although the landfill operation is still in progress, only one working area shall be reserved, and other exposed parts shall be temporarily covered with coverage materials;
- 6) the installed fence should have special measures to avoid a.m.a.p. flying plastic bags

(4) Collection and treatment of exhaust gas

102. When the domestic waste in the landfill is buried more than 10m, the landfill gas in the landfill shall be collected and treated to prevent pollution to the surrounding environment caused by gas leakage. The treatment method shall be determined according to the amount of gas collected and the local actual situation.

4.4. Trends

103. Not yet applicable.

4.5. Summary of Monitoring Outcomes

104. Not yet applicable.

4.6. Material Resources Utilisation

105. Not yet applicable.

4.7. Waste Management

106. Not yet applicable.

4.8. Health and Safety

107. Not yet applicable.

4.9. Training

108. During the reporting period, external training courses on environmental issues have not been conducted.

109. It is necessary to arrange training courses for the staff of the waste collection system after the new equipment is purchased. When purchasing waste trucks, specific requirements to personnel training are to be included into the conditions of the procurement contract. The training is to cover measures on safe and efficient operation of the vehicles, possible emergencies and repairs.

110. It is recommended to introduce a system for identification of occupational risks. The personnel of waste collection company shall take active part in such risk identification activities. The system shall be formalized by a document listing and ranking the existing risks and outlining risk management and mitigation measures, including identification of the need for protective means and clothing. The training program should be based on this document.

111. Also, after taking the landfill in operation from time to time the staff as to get training for operation, health and safety instructions for their daily work.

5. FUNCTIONING OF THE SEMP

5.1. SEMP Review

112. The assessment of compliance with the Environment Management Plan (EMP) commenced with the review of the environmental management conditions required for compliance during the construction stage of the project. These conditions are meant to be captured in the Specific Environmental Management plan (SEMP). In adding to previous explanation following items should be also taken in consideration by the upcoming monitoring.

113. The Specific Environment Management Plan (SEMP) is likely to have a requirement that detailed management plans are developed on a topic by topic basis (Waste Management Plans; Traffic Management Plans; Water Management Plans and etc.) Beside environmental management actions, SEMP defined what kind of mitigation measures have to be implemented by Contractor/Sub-contractor and how to conduct environmental monitoring during the construction work. SEMP defined place, time, parameters and responsibility of environmental monitoring. Sub-clauses of SEMP also included Contractor's schedule of submitting reports to CUCD – Consultant and PIU as EA.

114. These plans are detailed and set out how the project will address potential issues identified in the impact assessment process and ensure that specific mitigation and monitoring measures are fully implemented.

115. Where the impact assessment process has identified areas within the project which are particularly valuable or sensitive to possible change due to the project development, then it may be appropriate to develop an environmental management plan which will be focused on all activities which will take place in this location.

116. The basis of a Site Specific EMP (SSEMP) should be the contractors developed Construction Method Statements. As part of the Construction Method Statements the contractor shall, with the support of the ES and PIU-EA with using of the EIA/IEE and EMP as a starting point, conduct an Environmental, Health and Safety Risk Assessment for the proposed activities within the sensitive area. SSEMP should be prepared before commencement of construction activities and approved by the PIU.

117. The outcomes of the risk assessments, along with any existing mitigation or monitoring requirements set out in the EMP will be developed into the Site Specific EMP.

118. Within the above mentioned plans there will also be an Environmental Monitoring Plan for Construction and Operation period. This sets out the requirements for visual or physical measurements of environmental conditions prior to, during and post construction. As noted in the Introduction, this physical monitoring is a related subset of the process, which ensures that the ADB's environmental safeguard requirements are being met through the full implementation of the approved EMP. This physical form of monitoring should not be confused with the monitoring, perhaps better referred to an audit, that takes place to ensure that the EMP is being fully implemented.

Work Arrangement for CUCD

Design Phase

- ❖ Site visits, understanding of environmental conditions and resettlement and social activities of project site (already done);
- ❖ Prepare IEE, EIA, EMP, RP, SIA and SAP for approval by ADB.

Supervision Phase

- ❖ Based on approved EMP, guide and assist the environmental monitoring agency to carry out environmental monitoring and form quarterly environmental monitoring reports for submission to ADB.
- ❖ Based on approved RP and SAP, assist the Client to carry out resettlement investigation and social activity surveys, collecting data to form social safeguard reports for submission to ADB and organize social activities during construction.

6. GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

6.1. Good Practice

119. Not yet applicable.

6.2. Opportunities for Improvement

120. Not yet applicable.

7. SUMMARY AND RECOMMENDATIONS

7.1. Summary

121. In general, the implementation of environmental and social safeguards measures across different projects under SWMIP is in accordance with the loan covenants, contract specification and EMP stipulated in the contract and mostly found to be satisfactory during the reporting period.

122. The project is compiled in accordance with the planning of Tashkent, which can meet the landfill demand of domestic waste within the scope of service. From a technical and economic perspective, the project is feasible.

123. The landfill capacity is about 7.66 million m³, which can meet the landfill requirements in 12 years.

124. The construction of the landfill has improved the utilization rate of land, prevented the domestic waste from landfilling, and reduced the secondary pollution to the surrounding environment.

125. The project has convenient transportation, suitable transportation distance, suitable terrain, convenient water and electricity supply, and good construction conditions.

126. The landfill adopts improved anaerobic landfill treatment technology and single-layer horizontal composite seepage control method. Flood control facilities are arranged with flood intercepting trenches. The whole engineering design process is mature and reliable.

127. CUCD have mobilized their Environmental Officer in their respective packages to ensure effective implementation of EMP, identification of additional environmental issues as well as record keeping on environmental safeguards.

128. The detail design (DD) for the New Sanitary Landfill has been finalized in August 2019. All documents has been submitted to the state expertise committee for their assessment and approval. This is necessary prior announcing the project for international tendering and submitting the corresponding bidding documents.

129. CUCD cooperate prior finalization of the DD with the C_3 Consultant for the capacity developing - GWCC and the Waste Transfer and Valorisation Company as the Client has suggested. The received as waste composition and water content are used for the DD to estimate gas generation and leachate amount and implemented into the DD of the project

130. Due to the conditions that not sufficient land is allocated to new SLF this item will be not a part of the DD of CUCD. If the Client insist on building the plant later CUCD suggest to invite other expert to develop the design for a composting plant.

131. As soon as construction works commence (estimated Q1 2020), environmental monitoring will be continued.

132. Action plan for the reporting period from July-December 2019:

| # | Action | Time frame | Responsibility |
|----|---|---|---|
| 1. | Safeguard Compliance and Monitoring Report | Q1, 2020 | PIU Consultants National Social Safeguards and Development Specialist |
| 2. | Sanitary Landfill Facility Establishment and Dumpsite Closure - Design and Supervision | Q1, 2019 | CUCD Consultant |
| 3 | Procurement of Landfill Equipment - Equipment Commissioning | Q1, 2020 | City Tender Commission, PIU |
| 4 | Collect and provide the relevant information on environmental indicators to PIU. | Permanent ongoing | PIU Consultants National Social Safeguards and Development Specialist |
| 5 | Other routine issues like unscheduled site visits, follow up of the detected defects, environmental assessment of designs. | Upon the need | PIU Consultants National Social Safeguards and Development Specialist |
| 6. | Reporting on environmental safeguards | Monthly Bi-annual (acc. Contract) | PIU Consultants National Social Safeguards and Development Specialist |
| 7. | Sanitary Landfill Facility Establishment and Dumpsite Closure, Reporting on environmental safeguards, Other routine issues like unscheduled site visits, follow up of the detected defects, environmental assessment etc. | | CUCD Consultant Contracted Construction Company |

133. Specific Environmental Management Plan (SEMP) will be prepared SEMP has to be prepared before commencement of construction activities, during mobilization stage by Environmental Specialist of the construction company.

134. The preparation of the quarterly and semi-annual environmental reports will be continued but all items / paragraphs, which haven't changed or developed will not repeated as in the Bi-Annual Report.

135. The Environmental Monitoring Reports upon review and approval by ADB will be posted on the Maxsustrans website and disclosed on ADB web-site as before.

136. The next Semi-annual EMR (reflecting January-June 2020 reporting period) will be submitted to the Client/ PIU/ ADB in July 2020.

ANNEXES

Annex 1: Environmental Management Plan (as before)

| Sources of Impact | Impacts | Type / Degree of Effect | Mitigation / Enhancement Measures | Institutional Responsibilities | Cost |
|---|--|---------------------------|--|---------------------------------------|--|
| I. Pre-Construction Phase | | | | | |
| Land Acquisition | Loss of Agricultural Land | Significant and Long Term | <ul style="list-style-type: none"> • Not necessary • The landlord gives it back to the No IR impacts; • No mitigation measures for involuntary land acquisition; • The required lands for construction allocated from the district reserve land; • There is no possibility of any impacts in terms of losing incomes and livelihoods. • No grievance and complaints are received on project activity. <p>Ensure clear delineation and fencing of landfill area</p> | PIU for implementation and monitoring | Included in project Cost |
| Environmental and Social Monitoring and Assessment | Organizational capacity and commitment | Temporary and short term | <ul style="list-style-type: none"> • Establish and maintain Environmental, Social and Health & Safety Management System (ESHS). Employ EHS management staff with the Company. | CUCD | Own resources, Consultant remuneration |
| Occupational Health and Safety | PPE provision | Temporary and short term | <ul style="list-style-type: none"> • Carry out and keep updated OHS risk assessment of work places prepared by authorized consultant • Provide PPE for the staff of Company and include in tender documents the requirement for all contractors including the municipal waste collection company to provide adequate PPE according to OHS assessment of workplaces and the | PIU, CUCD | Own resources, Consultant remuneration |

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| | | | local regulations. | | |
| II. Construction Phase | | | | | |
| Land clearing | Generation of fugitive dusts | Temporary but long term | <ul style="list-style-type: none"> • Open only one area for development on a by phase basis as planned. • Minimize movement of vehicles inside the construction area • Cover exposed areas with tarps or similar materials / application of slope stabilization materials • Establish buffer zones and fences | Contractor/ CUCD to monitor for compliance and reporting to IA / SCEEP (State Committee on Ecology and Environmental Protection) | Include such measure in the Contractor's TOR |
| | Noise generation | Temporary and short term | <ul style="list-style-type: none"> • Notify the affected communities, adequately in advance, about the expected nuisance. • Reduce project traffic routing through community areas wherever possible. • Install mufflers and silencers for machines and equipment • Avoid working during rest periods / night time • Regularly maintain equipment • Establish fences around the work area as barrier • Impose minimum speed limits within the project site | Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP | Include such costs in the Contractor's contract |
| | Possible Soil erosion | Short-term and temporary | <ul style="list-style-type: none"> • Contain excavation and other similar activities within design boundaries • Immediately stabilize areas once cut and fill activities are completed • Introduce vegetative cover in areas that will remain permanently open • Cover with pebbles or gravel areas that are to remain open for a long period of time • Peak Ground Acceleration (PGA) | Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP | Include such measure in the Contractor's TOR |

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| | | | values for the site should be determined and incorporated in the design. | | |
| | Waste | Temporary and short term | <ul style="list-style-type: none"> • Ensure that all hazardous waste from temporary storage facility located at the landfill is sent to an appropriate final disposal facility | Contractor / PIU | Management time, as per contract |
| | Flora | Temporary and short term | <ul style="list-style-type: none"> • Re-introduce local occurring vegetative cover in areas within the SLF where it would be most appropriate. Shallow rooted vegetation is recommended | Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP | Include such measure in the Contractor's TOR |
| | Traffic | Temporary and short term | <ul style="list-style-type: none"> • Regulate the entry and exit of vehicles and equipment in the construction site • Properly regulate delivery of materials into the project site • Impose minimum speed within the project site • Do not allow vehicles to stay within the project site for a long period of time • Regular monitoring to ensure that traffic flow remains optimal and clean- up of any debris can be undertaken immediately. • Regular maintenance of equipment. | Contractor / CUCD to monitor for compliance and reporting to IA | Include such measure in the Contractor's TOR |
| | Occupational health and safety | Temporary and short term | <ul style="list-style-type: none"> • Induction and orientation meetings will be undertaken by all workers. Tool box talks are also recommended. • Only qualified workers will be hired • Strictly impose and monitor use of PPE by workers. Regular inspections will be conducted. • Provide HSE manuals and require placement of safety signs and placards | Contractor / CUCD to monitor for compliance and reporting to IA | Include such cost / measure in the Contractor's contract |

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| | | | <ul style="list-style-type: none"> • Restrict movement of personnel in danger zones • Insurance Policy for Workmen Compensation should be provided. • Conduct awareness and training programs on safety and health issues to be handled by the designated HSE Officer. | | |
| Community Impacts | Community health, safety and security | Temporary and short term | <ul style="list-style-type: none"> • Develop and implement procedures for protecting public health and safety (e.g. traffic management plan, fencing, drivers training program, pedestrian access and trespassing plan, road design, slope stability, clean-up of spills, well visible signage, awareness-raising) | Contractor / CUCD to monitor | Include such cost / measure in the Contractor's contract |
| | Loss of income of informal waste pickers | | <ul style="list-style-type: none"> • Identify alternative livelihood options for the waste pickers in accordance with the principles of livelihood framework prepared as above and in consultation with the affected people. | Local Hokimiyat | Consultant remuneration |
| Closure of the existing dumpsite | | Temporary and long term | <ul style="list-style-type: none"> • Conduct a detailed site assessment covering the entire 59 hectares • Development of a 'safe closure plan' • Adequate and prompt covering and compaction to prevent exposure of wastes • Induction and orientation meetings with special focus in the use of PPE will be undertaken by all workers. • Require placement of safety signs and placards • Conduct of post-closure environmental monitoring • Maintenance of installed facilities. • Precautionary measures should be taken to ensure uncontrolled fires are not started as a consequence of | <p>Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP</p> <p>Post closure management shall be handled by the IA / PIU</p> | Include such cost / measure in the Contractor's contract |

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| | | | the closure activities. | | |
| III. Operation Phase | | | | | |
| Operation of the SLF | Air Emissions / Air Quality | Permanent and long term | <ul style="list-style-type: none"> • Gas emission (i.e. generation of objectionable odors) from the landfill is expected to be moderate. • Provide all employees with appropriate PPE • Monitor air quality based on a specified in the monitoring program • Regulate movement of vehicles inside the landfill to minimize emissions | PIU and SCEEP for monitoring | Cost should be included in the operating budget |
| | Health & Safety | Significant, permanent and long-term | <ul style="list-style-type: none"> • Strictly impose and monitor use of PPE by personnel especially those engaged in the handling of wastes • Provide and require safety signs and manuals • Restrict movement of personnel in danger zones • HSE manual and Insurance Policy for Workmen Compensation should be provided. • Conduct awareness and training programs on safety and health issues • Make available first aid kits in the landfill area • Make available a vehicle that can bring victims to hospitals • Strictly monitor the entry and exit of outsiders inside the landfill • Precautionary measures should be taken to ensure uncontrolled fires are not started as a consequence of | PIU and PIU Consultant for monitoring | Cost should be included in the operating budget |

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| | | | operational activities. | | |
| | Noise | Insignificant, long term and permanent | <ul style="list-style-type: none"> • Install mufflers and silencers for machines and equipment • Avoid working during rest periods • Regularly maintain equipment • Impose minimum speed limits within the project site | PIU and SCEEP for monitoring | Cost should be included in the operating budget |
| | Groundwater quality | Significant, permanent, long term | <ul style="list-style-type: none"> • Use of HDPE liner and establish leachate collection and treatment system as designed and planned • Monitor leachate quality, if any • Ensure that no leachate percolate into the ground by consistently conducting quality checks of liner prior to disposal. • Ensure that all leachate are collected and treated • Properly cover the landfill after the cell is filled • Introduce vegetative cover in areas where it would be applicable to promote evapo-transpiration and re-direct portions of the precipitation. | PIU Consultant, PIU and SCEEP for monitoring | Cost should be included in the operating budget |
| | Vermin & other pests | Significant, temporary and short term | <ul style="list-style-type: none"> • Ensure that all containers are properly enclosed to avoid manifestation • Covering should be done every end of the day's operations | PIU / SCEEP for monitoring | Cost should be included in the operating budget |
| Operation of the SLF | Traffic | Significant, long term and permanent | <ul style="list-style-type: none"> • Regulate the entry and exit of vehicles and equipment in the SLF • All dump trucks should carry a waste manifest / legal papers to avoid long stand by times at the gate. • Impose minimum speed within the project site. • Do not allow vehicles to stay within the project site for a long period of | Local authorities | Cost should be included in the operating budget |

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|--|-----------------|--------------------------------------|---|---------------------------------------|----------------------------------|
| | | | <p>time</p> <ul style="list-style-type: none"> • Proper maintenance of the internal road network. • Employ a traffic management system at the ingress/egress of the project site. A traffic circulation plan should be developed not to hamper the traffic flow. | | |
| Operation of auxiliary facilities (e.g. Leachate Treatment Plant) | Air Emissions | Significant, permanent and long term | <ul style="list-style-type: none"> • Foul odors are expected to be a permanent feature of the plant. It is therefore necessary that most appropriate ventilation system is implemented. This system should also maintain the appropriate air exchange ratio to minimize stagnation within the plant. • provide all employees with appropriate PPE • monitor air quality (indoor and outdoor) based on a specified in the monitoring program • Regular monitoring for any leaks (loss in pressure) and/or for spills | SCEEP for monitoring | Included in the operating budget |
| | Health & Safety | significant, permanent and long term | <ul style="list-style-type: none"> • Training for personnel pertinent to operations and maintenance. • Provide the necessary PPE and strictly impose and monitor its use by employees • Provide require safety signs and placards and restrict movement of personnel in danger zones • Conduct awareness and training programs on safety and health issues • Make available first aid kits • Strictly monitor the entry and exit of outsiders inside the facility | Consultant, PIU/ SCEEP for monitoring | Included in the operating budget |

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|--|----------------------|--|---|---------------------------------------|---|
| Operation of auxiliary facilities (e.g. Leachate Treatment Plant) | Groundwater quality | Moderate, permanent and long term | <ul style="list-style-type: none"> • Ensure that all containers and tunnels are properly sealed • Ensure no leakages in the containers • Whenever applicable, all floors must be properly sealed • Ensure that leachate and other spills are properly collected and not disposed in sensitive areas • Water usage shall be monitored. | Consultant, PIU/ SCEEP for monitoring | Cost should be included in the operating budget |
| | Noise | Insignificant, negligible and short term | <p><i>Note: There are no sources of high level noise from the operation of the plant.</i></p> <p><i>Whenever excessive noise is to be generated, this will be short term.</i></p> | PIU and SCEEP for monitoring | Cost should be included in the operating budget |
| | Vermin & other pests | Insignificant, negligible and short term | <p><i>The presence of vermin and pest will be very minimal since the facility and its equipment are totally closed. To ensure that employees are not exposed to deleterious materials;</i></p> <ul style="list-style-type: none"> • All workers and personnel shall be provided with appropriate PPE • Use of the PPE must be strictly implemented and monitored. | PIU Consultant, PIU for monitoring | Cost should be included in the operating budget |
| The environmental management plan [especially for the construction phase] does not claim to be complete and can be expanded at any time according to the need and necessity. | | | | | |