



UNOPS – Tashkent Office

Project Social and Environmental Management Plan – EM01

March 2024

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1.0 Introduction

1.1 Intro and scope of the Project S&E Management Plan

UNOPS recognizes its responsibility to protect the environment and to promote positive societal outcomes in the communities in which we work.

This Project Social and Environmental (S&E) Management Plan (hereafter “the Plan”) describes how UNOPS intends to manage environmental and social issues under the sphere of influence of this project. It identifies the procedures to be followed by all personnel working in the project.

This Plan is a live document that will be reviewed on the regular basis and updated if necessary..

1.1 Project description and key date

1.1.1 Table 1- Project Details

Project Title	COVID-19 Emergency Project
Project Location	Uzbekistan
UNOPS Project No.	23327
Project Duration	Dec 23, 2022 to Jan 31, 2025
Project Health and Safety Management Level	Level 3
Project Overall Risk Score, and sub-scores for elements 2 and 3	Risk Score -3
UNOPS Project Manager	May-Britt EBERT
UNOPS Project H&S Manager/ Coordinator	Jerry MCCOOL / T.B.C

1.3 Roles and responsibilities

While the Project Manager holds the overall responsibility for Social and Environmental Management in the Project, other roles may hold accountability, or need to be consulted and informed of various work packages (e.g. the Contractor, the Office Director, the Programme Manager, the Project Design Manager). Table 2 below outlines Roles and responsibilities for Infrastructure projects in the assurance set-up.

1.3.1 TABLE 2 - RACI TABLE

ACTIVITY	UNOPS Consultant Technical Supervisor	UNOPS PROJECT MANAGER	Project Engineer *	Project Design Manager*	Contractor *
Ensure that the Environmental and Social screening has been performed	A	R			
Ensure that the Environmental/Social Review and the ESIA have been performed (if applicable)	A	R			
Ensure that the risks and opportunities for the project over its life-cycle have been identified	A	R			
Draft the S&E Plan	A	R			
Eliminate foreseeable environmental and social risks	A	R		R*	

through engineering design solutions					
Transmit to procurement function the environmental/social requirements for contractors and suppliers	A	R			
Ensure regular liaison between parties on site on Environmental and Social matters (including regular meetings)	A	R	C		
Ensure Consultation with the workforce, visitors and affected stakeholders	A	R	C		
Ensure that Contractor(s) employ effective S&E Management techniques	A	R	C		
Ensure arrangements are in place for Site induction, training and briefings	A	R	R		R*
Ensure that Waste Management is performed according to plans	A	A	R		R*
Ensure that other environmental and social activities are performed according to plans	A	A	R		R*
Conduct site inspections according to stated frequency	A	C	R		
Compile quarterly reports of performance and report to HQ	A	R	C		
Ensure reporting of environmental accidents, incidents and high potential near-misses	R	C	I		R*
Review and update the Plan at the indicated frequency or when circumstances change	A	R			

A - Accountable (overall responsibility)

C - Consulted (supports, has the information or capability required)

I - Informed (notified but not consulted)

R - Responsible (gets the work done)

R* - refers to Work Package Responsibility

2. Local laws, regulations and other compliance requirements

HSE legislation in [Uzbekistan](#) is described in the Office Legal Register using form [HSE03](#). This should also include the relevant requirements of interested parties that have been identified by the local office using form [HSE02](#).

A check for legal compliance has been performed to ensure that this office is compliant with legal and other requirements, using form [HSE04](#).

A copy of the legal register is available [here](#). UNOPS Project HSE Manager will review these laws and regulations every *12 months* using *the list of laws published in the official websites of the Republic of Uzbekistan* to make sure that there are no changes which may affect this plan.

3.0 Operational planning (for multiple sites, detail all site-specific information)

3.1 Social and environmental screening report

At the pre-engagement stage of the project, the project developer completed the Environmental and Social screening report ([Form EM03](#)).

3.2 Identified social and environmental risks and opportunities

The main environmental and social aspects of the activities, products and services that are under the project's control and influence are identified and detailed using [Form EM04](#).

The full Analysis of environmental and social aspects for the project (will be is attached to this Plan) as Annex

3.3 Objectives and targets

The project will have the following Environmental and Social objectives and targets:

#	Objective	Target (measurable where practicable)	Action/Program/Resources	Responsible	Target Date
1	Implement Management System Requirements .	Ensure that the contractor's main staff are briefed on relevant HSE plans . They will then brief their work force on the relevant HS matters. Conduct weekly HSE inspections at site. Hold a Tool Box Talks weekly. Perform Fire Drills HS04 Form . Annually check local law for ongoing compliance with UNOPS Tashkent HSE Management Plans.	Generate awareness of every UNOPS PRPC personnel on the importance of implementation of HSE plans. Ensure that responsible personnel understand their duties and apply accordingly. In cooperation with the Contractor ensure that Fire Drill is performed at least twice a year. Annually check the Official using the list of laws published in the official websites of the Republic of Uzbekistan to make sure that there are no changes which may affect this plan.	Project Manager & H&S Manager	Ongoing through 2024

2	Consultation and capacity building with Contractors.	Ensure that Contractor(s) is/are aware of the existence of HSE plans . Implement HSE plans in cooperation with contractor(s).	Include SE Plans and requirements in the ITB process for work. Conduct weekly HSE inspections together with contractor(s) HSE representatives. (On site) Hold Toolbox Talks together with contractor(s) or if relevant supervise contractor(s) HSE representative TT. Perform Fire Drills (every time the site layout changes) or if no change to site lay out then every 6 months in cooperation with contractor(s) at site.	Construction Manager & Project Engineer	2024
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4.0 Management of contractors and sub-contractors

- Bidders receive key documentation outlining the requirements of UNOPS Environmental and Social Management Systems during the tender phase. The selected contractor shall comply with all UNOPS S&E requirements for the whole duration of the contract. These requirements equally apply to any subcontractors hired by the contractor. It is the contractor's responsibility to ensure that subcontractors comply and to demonstrate such compliance in submittals and during verification processes by UNOPS.
- If pre-bid meetings, site visits and/or contract commencement meetings are carried out, S&E requirements and submittals should be discussed, both for day-to-day work and for S&E critical stages/activities.
- Environmental and social management at project site.
- It is expected that the sub-contractors appointed by the main Contractor(s) will fully comply with UNOPS Social and Environmental management standards for Level 3.
- Contractors and subcontractor(s) to inform immediately the UNOPS Project Manager or most senior representative on the project if any planned activity entails an unforeseen risk to the environment or society.
- Contractor should ensure that all sub-contractor's personnel have received proper induction and awareness arising as necessary on Social and Environmental management practices, and are aware of relevant site rules.
- It is the Contractor(s) responsibility to keep the Social and Environmental records of their subcontractors or partners in a joint venture, and to keep those records available for UNOPS inspection at any time.

In addition to the formal responsibilities detailed within the general conditions of contract, all persons on the project site have a responsibility to take reasonable care for the health and safety of themselves and others who may be affected by their actions, cooperate with the employer on health and safety matters and not to interfere with, remove or alter anything provided on site for health, safety and welfare.

5.0 Waste Management

A Waste management plan for the project has been developed using [Form EM06](#), Example

The plan shall be monitored and updated

6.0 Gender mainstreaming

The process of assessing the implications for women and men of any [planned action](#), including legislation, policies, or programs, in all areas and at all levels. It is a way to make women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring, and evaluation of policies and programs in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated.

The project has considered gender mainstreaming in its activities:

- Development of the [project gender action plan](#);
- Integration of gender evaluation criteria to the procurement processes;
- Adaptation of the project facilities in line with gender and inclusivity parameters (separated dressing rooms, showers, etc.).

7.0 Site inspections

UNOPS plans to implement weekly environmental and social inspection on this project. Inspection will be carried out by UNOPS site representatives and Contractor(s) Project and Environmental/Social managers.

When carrying out the site weekly inspection, all aspects contained in the Health, Safety, Social and Environmental inspection site report ([form HSE05](#)) should be reviewed.

8.0 Site induction and training

Site induction, training and briefings will be given in accordance with this training matrix:

8.1 Table 4 - Training

Planned Training	Nominated Staff	Frequency
Health, Safety and Environmental Management Training	UNOPS supervising engineers	Once
E-LSMP (UNOPS Internal training)	UNOPS supervising engineers	Once

The HSE training matrix [Form HSE18](#) can be used to keep detailed records of site inductions, toolbox talks and training.

9.0 Emergency and evacuation procedures

Emergency information details including the site location, neighbours, emergency contact details, location of the spill kits, high priority flora/fauna, culturally sensitive sites are provided within the Site emergency and evacuation plan.

Emergency and evacuation procedures will be tested through appropriate drills that will be held every 6 Months and, where possible, may involve relevant interested parties [UNOPS, Contractor's Personnel, and specify others].

Emergency procedures should be periodically reviewed to ensure continued relevance.

10.0 Communication and information sharing

10.1 Internal communication

Internal communication for the Project will include as a minimum:

- S&E Monthly meetings. They may be dedicated to S&E or S&E may be one part of the agenda. Additional S&E meetings will be organised when needed. Meeting minutes will be distributed to UNOPS, Contractor's team and sub-contractors.
- Weekly inspections ([form HSE05](#)); including Environmental and Social items, will be performed jointly by the UNOPS team and the Contractor(s) team; the report will be prepared by UNOPS S&E Manager/Coordinator and shared with the Contractor(s) for necessary actions.
- Site HSE quarterly report ([form HSE12](#)); the HSE quarterly report is a summary of the site weekly inspection report findings and corrective action. It is prepared by the UNOPS site HSE Manager/Coordinator to be shared with the Contractor(s) and with UNOPS Senior Management in the country as well as with UNOPS HQ.
- Toolbox talks
- Information and guidance signage will be present at site in English and Russian
- The Site Notice Board will be used to convey daily updates and information.
- Updates and information will also be conveyed during weekly site meetings

10.2 External communication

Queries on environmental and social management from local communities, journalists, business community, neighbours, local representatives, and any other external parties will be handled according to the following protocol:

10.3 Consultation with the workforce

Arrangements for consulting and coordinating with the workers at site will be as follows:

- An employee representative will participate in the regular and extraordinary meetings between UNOPS and the Contractor(s)
- All Contractor's and sub-contractor's employees will be encouraged to raise any suggestions and concerns on environmental and social management of the project on an ongoing basis and during meetings, briefings, toolbox talks, etc.

11.0 Accident and incident reporting and investigation.

All significant accidents or incidents and high potential near misses shall be reported to UNOPS HQ using form [HSE09](#).

They should be thoroughly investigated and action taken to prevent recurrence. For Class 1 incidents, the outcomes of the review shall be reported to UNOPS HQ using [form HSE10](#). Lessons learned should be captured using [HSE11](#).

UNOPS and Contractor's personnel have an obligation to report all incidents and near misses to the UNOPS Project Manager/ESM coordinator, and will receive proper induction in this sense. Main incidents and near misses should be recorded in Table 5:

11.1 Table 5 – Incidents/near misses

Incident/near miss description	Date	Corrective action taken
[]	[]	[]
[]	[]	[]
[]	[]	[]
[]	[]	[]

12.0 Audit and monitoring

12.1 Project files and records

UNOPS environmental and social management electronic files will form the archived component of the records for this project, in line with UNOPS Record Retention Policy and to facilitate internal and external audit and review. As a minimum they will consist of:

- A copy of [legal register](#)
- The Project Social and Environmental management plan with its Annexes
- [Site waste management plan](#) and records
- S&E meetings minutes
- [Weekly site inspection reports](#)
- Quarterly HSE site reports
- Incidents investigation reports and near misses
- Emergency drill records
- Record of training and toolbox talks
- A copy of any S&E related correspondence in the project including any nonconformities notification for the Contractor(s)
- Internal and External Audits records
- Copy of the latest UNOPS HQ Management Review records

The UNOPS S&E system shall be formally documented to allow for control and accountability.

12.2 Audit and monitoring

Environmental and social performance at site will be regularly monitored through:

- Weekly site inspections
- Ad hoc site inspections
- Internal peer reviews if requested by UNOPS HQ
- External audit visit if requested by UNOPS HQ

13.0 Revisions of the Plan

13.1 Table 6 - Revisions


Revision date	Name and title	Description of main changes

14.1 Table of references to Templates and Guidance documents

14.1.1 Table 7 - References

TOPICS	TEMPLATES	GUIDANCE
Legal review	HSE02 Register of interested parties HSE03 Legal register HSE04 Check for legal compliance	
Social and environmental screening	EM03 Environmental and social screening report	
Social and environmental assessment	EM05 Environmental review report TOR for ESIA	
Analysis of environmental and social risks and opportunities	EM04 Register of environmental and social risks and opportunities	GEM01 Generic REI
Waste management	EM06 Waste management plan – site EM07 Waste management plan – office	GEM02 Waste management GEM07 Hazardous waste
Gender mainstreaming	Gender Action Plan template	Gender checklists Gender Mainstreaming in projects
Other environmental management topics		GEM03 Protection of water GEM04 Wastewater management GEM05 Borrow pit management
Other social management topics		GEM06 Historical
Site induction and training	HSE07 Site induction register HSE08 Visitor induction register HSE18 Training matrix	See catalogue of Toolbox talks
Site weekly inspections	HSE05 HSE inspection report – site	GHSE04 Mandatory HSSE Inspections
Management of contractors and sub-contractors		See guidance for Contractors working with UNOPS
Emergency and evacuation procedures	Site emergency and evacuation plan HS03 Emergency contact numbers HS04 Emergency drill record	GHS10 Accident response
Accident/incident reporting	HSE09 Incident report form HSE10 Incident review form HSE11 Incident highlight form	GHSE09 Reportable Incidents and Incident Examples
Communication and reporting	HSE12 Quarterly HSE report – site	
Audit and monitoring	HSE16 Internal review (audit)	

 = UNOPS responsibility (usual set-up in assurance position)

 = Contractor responsibility (usual set-up in assurance position)

Legal Register for Health, Safety and Environment

Office/Project	UNOPS Office in Tashkent, Uzbekistan
Location	Uzbekistan
Revision and date	18.01.2023

I. Introduction

UNOPS premises are protected by the Immunities and Privileges of the United Nations. These immunities also apply to UNOPS staff. It is the intention of UNOPS to ensure that operations do not operate below the standard of local legislation (see the UNOPS Health and Safety policy and the UNOPS Environmental Policy). Contractors and construction sites have an even higher obligation to meet legal and other obligations as they are incorporated under local laws. The contractors are assumed to have control over their ability to meet local legislation at UNOPS construction sites. UNOPS has the role of enforcing legal and other requirements in line with the UNOPS policy commitment.

When researching for applicable national legal HSE requirements, it is recommended that existing legislation in the following areas be explored:

Access/ Egress	Small tools
Fire/Emergency Prevention and Response	Work over water
Ergonomics	Work interactions (e.g. stress, psychosocial)
Occupational Health Stressors	Use of Lifting Machinery
Pressurised equipment	PPE
Electrical equipment	Other general H&S requirements
Hazardous substances	Water quality and management
Preparation of food	Air quality
Structures	Waste
Transportation	Resources conservation
Working at heights	Pollution control
Excavation	Other general environmental requirements

II. Legal Register

No	Legislation/Requirement	Source	Requirements
1	United Nations, Occupational Safety and Health Management System	ST/SGB/2018/5	The occupational safety and health management system shall be implemented in a phased manner at the central and departmental levels and shall integrate, harmonize and update existing occupational safety and health-related policies and programmes
2	A system-wide road map for United Nations climate neutrality by 2020 and of the related goals towards enhancing the environmental sustainability of United Nations operations	CEB/2015/HLCM/7 of 31 March 2015	United Nations climate neutrality by 2020 and enhancement of environmental sustainability
3	Environmental Sustainability Management in the UN System	CEB/2013/HLCM/5 of 7-8 March 2013	Development and implementation of environmental sustainability management systems in each UN organization
4	A framework for advancing environmental and social sustainability in the United Nations system	UN Environmental Management Group, 2012	Moving UN organisations towards strengthening environmental and social sustainability in our activities
5	EOD 3 "Health & Safety and Social & Environmental Policy"	UNOPS	Establish UNOPS Social, Environmental and H&S policies
6	EOI.CSG.2017.01 on Implementation of HSSE levels	UNOPS	Establishes the Health & Safety, and Social & Environmental requirements at UNOPS locations
7	EOI.CSG.2017.02 on Incident reporting	UNOPS	Establishes the requirements for reporting incidents
8	OI.PCG.2017.01 "Personnel Management Framework" on work-life balance	UNOPS	Supports personnel in balancing the demands of work and personal life
9	United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, Section D. Road Safety. 31 October 2011	UNDSS	Promotes the safe operation of United Nations vehicles world-wide, to ensure road safety and to describe the roles and responsibilities of relevant United Nations Security Management System (UNSMS) actors in improving awareness and compliance with requirements and provisions for road safety
10	OD.PCG.2017.01 "Human Resources, Ethics and Culture" on discrimination, harassment and abuse of authority	UNOPS	Ensures the workplace is free of any form of discrimination and harassment
11	Law No. ZRU-410 LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR SAFETY	Republic of Uzbekistan	This law applies to all employees who are in labour relations with enterprises, institutions, organisations *various forms of ownership and management, including with individual tenants; members of cooperatives, students of higher educational institutions, students of secondary specialised educational institutions, and vocational schools and general education schools

			undergoing industrial practice, military personnel recruited to work at enterprises; citizens undergoing alternative service; persons serving sentences under a court verdict, during the period of their work at enterprises of correctional labour institutions or enterprises determined by the bodies in charge of the execution of sentences, as well as participants in other types of labour activity organised in the interests of society and the state.
12	LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR CODE	Republic of Uzbekistan	Labor Code of the Republic of Uzbekistan, which describes safe working conditions, labour protection rights and health of workers.
13	LAW OF THE REPUBLIC OF UZBEKISTAN ON FIRE SAFETY	Republic of Uzbekistan	The purpose of this Law is to regulate relations in the field of fire safety.
14	LAW OF THE REPUBLIC OF UZBEKISTAN ABOUT NATURE PROTECTION	Republic of Uzbekistan	This Law establishes the legal, economic and organisational foundations for the conservation of environmental conditions, rational use of natural resources. It aims to ensure a balanced harmonious development of relations between man and nature, the protection of ecological systems, natural complexes and individual objects, and guarantee the rights of citizens to a favourable environment.
15			
16			
17			
18			
19			
20			

III. References

1. Convention Immunities and Privileges of the United Nations.
https://treaties.un.org/doc/Treaties/1946/12/19461214%2010-17%20PM/Ch_III_1p.pdf
2. <http://www.un.org/en/ecosoc/docs/2010/res%202010-23.pdf>
3. ILO: Safety and Health in Construction Convention no. 167 (Dec. 2014)
http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312312
4. ECOLEX, the gateway to environmental law, operated jointly by FAO, IUCN and UNEP
<http://www.ecolex.org/start.php>
5. NATLEX, the ILO database of national labour, social security and related human rights legislation
http://www.ilo.org/dyn/natlex/natlex4.home?p_lang=en
6. LEGOSH, the ILO global database on occupational safety and health legislation
<http://www.ilo.org/dyn/legosh/en/f?p=LEGPOL:1000>
7. United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, D. Road Safety. 31 October 2011,
https://www.un.org/undss/sites/www.un.org.undss/files/docs/security_policy_manual_spm_e-book_as_of_29_nov_2017_0.pdf
8. ST/SGB/2018/5 United Nations, Occupational Safety and Health management System
- 9.

Register of Interested Parties

Office/Project	UNOPS Office in Tashkent (Projects to be added)
Location	Tashkent, Uzbekistan
Revision and date	18.01.2023

“Any persons or organisations that can affect, be affected by or perceive itself to be affected by UNOPS decisions and/or activities”

Step 1: List interested parties (e.g. beneficiaries, communities, suppliers, NGOs, donors, regulators, our personnel, partners, etc.)

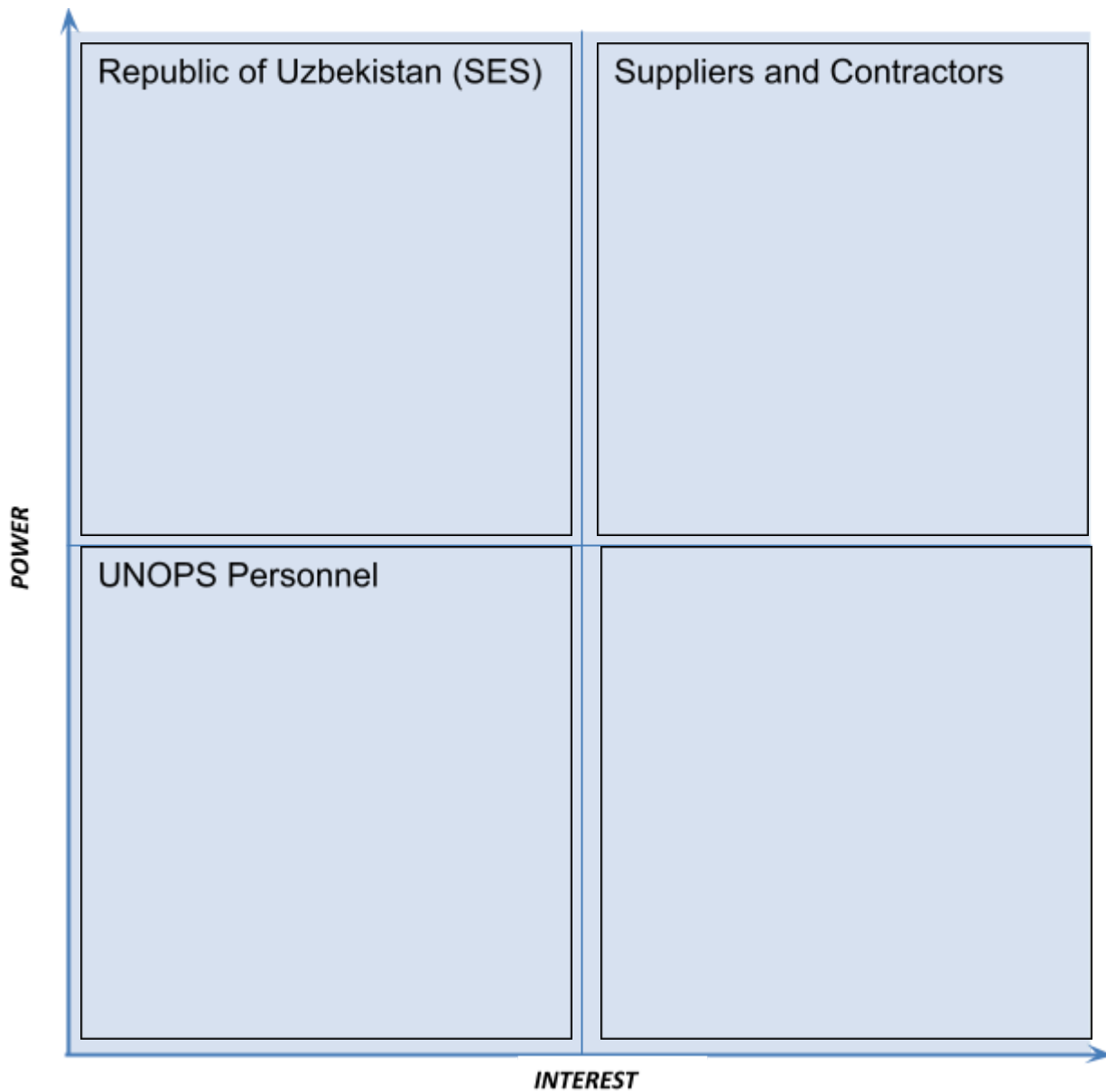
Step 2: Describe how you will determine their requirements (i.e. their needs and expectations)

Step 3: List the requirements you have identified, and highlight those that will become compliance obligations (NOTE: make sure you include compliance obligations in the Legal Register, HSE03)

1. List of interested parties and methodology for determining requirements

Interested party	Requirement	Requirement identified by way of
1. UNOPS personnel	Good communication Personal development Opportunity to express opinions Job stability and career	People survey
2. Suppliers and Contractors	Technical expertise Efficiency, responsiveness Good collaboration	Communication Agreements Contracts
3. Republic of Uzbekistan (Sanitary and Epidemiological Welfare and Public Health Service) SES	Republic of Uzbekistan has established laws on labor safety, nature protection and fire safety code on working conditions, labor protection rights and health of workers.	Law No. ZRU-410 LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR SAFETY LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR CODE LAW OF THE REPUBLIC OF UZBEKISTAN ON FIRE SAFETY LAW OF THE REPUBLIC OF UZBEKISTAN ABOUT NATURE PROTECTION

2. Determination of compliance obligations for Enter the name of your office based on a power/interest grid analysis



3. Identified compliance obligations must be reported in the Legal Register (form HSE03)

Check for compliance requirements for Health, Safety and Environment

Office/Project	UNOPS Office in Uzbekistan, Tashkent
Location	Tashkent
Revision and date	Rev 00, 18.01.2023

I. Immunities and Privileges of the United Nations

The founding Charter of the United Nations provides for the privileges and immunities “necessary for the fulfilment of its purposes.” (Article 105, UN Charter). The Convention on Immunities and Privileges adopted by the General Assembly of the UN on 13 February 1946 details the specifics of these legal exemptions.

This means that while UNOPS as a separate entity of the United Nations is exempt from compliance with local laws, it does interact with local governmental agencies for the provision of services and should meet the minimum standards for the operation of these services if not exceed them according to international standards.

II. UN requirements and UNOPS HSE minimum standards

The regulations and requirements put forth in the UN system should be applied to UN facilities. Therefore, UNOPS shall meet the requirements of the UN Occupational Safety and Health Management System (ST/SGB/2018/5 of 20 July 2018); of the UN Climate Neutrality Strategy and the Strategic Plan for Environmental Sustainability Management (CEB/2013/HLCM/2); and the UN Roadmap towards Climate Neutrality by 2020 (CEB/2015/HLCM/7 of 31 March 2015); and of other relevant UN initiatives and frameworks.

UNOPS minimum standards for Health, Safety and Environment apply in all its projects and operations, also in cases where they go beyond and above local legislative requirements.

III. Check for compliance requirements

Item ¹	Legislative instrument (law, regulation, decree, etc.)	Area of concern/hazard regulated	Year	Regulatory Body	Requirements	Compliance (Y/N)	Evidence of Compliance/ Corrective Actions
1	ST/SGB/2018/5 United Nations Occupational Safety and Health Management System	Other general HS requirements	2018	UN	The occupational safety and health management system shall be implemented in a phased manner at the central and departmental levels and shall integrate, harmonize and update existing occupational safety and health-related policies and programmes.	Y	HSSE team is leading corporate implementation of the system / UNOPS progress is aligned with the system
2	A system-wide road map for United Nations climate neutrality by 2020 and of the related goals towards enhancing the environmental sustainability of United Nations operations	Other general Environmental requirements	2015	UN	United Nations climate neutrality by 2020 and enhancement of environmental sustainability	Y	HSSE team accounts for corporate greenhouse gas emissions and purchases Certified Emission Offsets; Environmental sustainability is in place under the UNOPS HSSE programme
3	Environmental Sustainability Management in the UN System	Other general Environmental requirements	2013	UN	Development and implementation of environmental sustainability management systems in each UN organization	Y	Environmental sustainability is in place under the UNOPS HSSE programme

¹ Ensure numbering of legislative instruments is aligned and can be cross-referenced with those included in the Legal register.

4	A framework for advancing environmental and social sustainability in the United Nations system	Other general Environmental requirements	2012	UN	Moving UN organizations towards strengthening environmental and social sustainability in our activities	Y	HSSE management systems, GRI reporting
5	EOD 3 “Health & Safety and Social & Environmental Policy”	Health, Safety, Social and Environmental requirements	2017	UNOPS	Establish UNOPS Social & Environmental and H&S policies	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
6	EOI.CSG.2017.01 on Implementation of HSSE levels	Health, Safety, Social and Environmental requirements	2017	UNOPS	Health, Safety, Social and Environmental instructions	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
7	EOI.CSG.2017.02 on Incident reporting	Health, Safety, Social and Environmental requirements	2017	UNOPS	Health, Safety, Social and Environmental instructions	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
8	OI.PCG.2017.01 “Personnel Management Framework” on work-life balance	Other general HSSE-related requirements	2017	UNOPS	Support personnel in balancing the demands of work and personal life	Y	Part of UNOPS systems; IAIG audit internal processes
9	United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, Section D. Road Safety	Transportation	2011	UNOPS	Promote the safe operation of United Nations vehicles world-wide, to ensure road safety and to describe the roles and responsibilities of relevant United Nations Security Management System (UNSMS) actors in improving awareness and compliance with	Y	UNOPS follows the UN Road Safety Strategy


					requirements and provisions for road safety		
10	OD.PCG.2017.01 "Human Resources, Ethics and Culture" on discrimination, harassment and abuse of authority	Other general HSSE-related requirements	2017	UNOPS	Ensuring the workplace is free of any form of discrimination and harassment	Y	Part of UNOPS systems; IAIG audit internal processes
11	Law No. ZRU-410 LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR SAFETY	Labor Safety		Republic of Uzbekistan	This law applies to all employees who are in labor relations with enterprises, institutions, organizations *various forms of ownership and management, including with individual tenants; members of cooperatives, students of higher educational institutions, students of secondary specialized educational institutions, and vocational schools and general education schools undergoing industrial practice, military personnel recruited to work at enterprises; citizens undergoing alternative service; persons serving sentences under a court verdict, during the period of their work at enterprises of correctional labor institutions	Y	Part of Republic of Uzbekistan Legislation


					or enterprises determined by the bodies in charge of the execution of sentences, as well as participants in other types of labor activity organized in the interests of society and the state.		
12	LAW OF THE REPUBLIC OF UZBEKISTAN ON LABOR CODE	Labor Code		Republic of Uzbekistan	Labor Code of the Republic of Uzbekistan, which describes safe working conditions, labor protection rights and health of workers.	Y	Part of Republic of Uzbekistan Legislation
13	LAW OF THE REPUBLIC OF UZBEKISTAN ON FIRE SAFETY	Fire Safety		Republic of Uzbekistan	The purpose of this Law is to regulate relations in the field of fire safety.	Y	Part of Republic of Uzbekistan Legislation
14	LAW OF THE REPUBLIC OF UZBEKISTAN ABOUT NATURE PROTECTION	Environment Protection		Republic of Uzbekistan	This Law establishes the legal, economic and organizational foundations for the conservation of environmental conditions, rational use of natural resources. It aims to ensure a balanced harmonious development of relations between man and nature, the protection of ecological systems, natural complexes and individual objects, and	Y	Part of Republic of Uzbekistan Legislation

					guarantee the rights of citizens to a favorable environment.		
15							

IV. References

1. Convention Immunities and Privileges of the United Nations.
https://treaties.un.org/doc/Treaties/1946/12/19461214%2010-17%20PM/Ch_III_1p.pdf
2. <http://www.un.org/en/ecosoc/docs/2010/res%202010-23.pdf>

	Social and Environmental Screening Report - EM 03 © UNOPS 2017, v 2.0	
<p>Projects are screened for their inherent social and environmental risks regardless of planned mitigation and management measures. It is necessary to identify potential inherent risks in the event that mitigation measures are not implemented or fail. This means that risks should be identified as if no mitigation or management measures were to be put in place.</p>		
SECTION A: General Information		
Project title	23327 Uzbekistan COVID-19 Emergency Project	
Proposed project budget	USD 160,750,000.00	
Proposed project duration	26 months	
Implementing BU	B5010 - ECR, AUMCO, Uzbekistan Office	
Project manager/ Developer	Brendan KEIRNAN	
Officer responsible for social & environmental screening	Artem KULBASHNYI	
Brief outline of the project scope	The main objective of the Project is to urgently increase Uzbekistan's resilience to COVID-19 pandemic and other epidemics, supporting the testing, surveillance, and case management of COVID-19 in Uzbekistan by equipping and refurbishing the national laboratory system, establishing an ICT-based national surveillance and monitoring system, and improving and expanding the COVID-19 treatment capacity.	
Service line	Procurement	
Role	Implementation	
Site/No site	Without physical site	
Does the project need to screen?	Yes, continue to Section B	

			Register of environmental and social risks - EM 04 <small>© UNOPS 2017, v 2.2</small>				
			Instructions - All fields are mandatory 1: Activity: Shortly describe all main activities that take place in the office/project. 2: Environmental/Social aspect: Describe the environmental and/or social aspects that interacts with the environment and with the society. Note that one activity can potentially entail more than one environmental and/or social aspect. 3: Lifecycle stage: Indicate at which stage of the lifecycle of a product/service this aspect is occurring. 4: Potential impact: Describe the risk or opportunity that will occur in the environment and/or society due to this aspect. 5: Significance: Select the significance of the risk. 6: Action required: Describe what action(s) could be taken to address this risk, either for mitigation of a threat or for enhancement of an opportunity.				
			Office/Project:		Date:		
#	Activity	Environmental/Social aspect	Lifecycle stage	Potential Impact (negative/risk or positive/opportunity)	Significance	Action required (mitigation or enhancement)	responsibility
Design stage							
1	Inadequate design	The SES facility are located in seismic region, which have significant influence to structural design and structural design and analysis	Design	Negative/risk	3=medium risk	Inadequate constructed SES facilities can be collapse during a possible earthquake	Contractor/Unops
2	Existing trees	Local laws are not allowed cut existing trees	Design	Negative/risk	3=medium risk	The existing trees should be integrated to new project	Contractor/Unops
3	Land use (existing external pipe network)	Existing external pipe network should be considered during design process	Design	Negative/risk	3=medium risk	The existing external pipe network should be integrated to new project	Contractor/Unops
Construction stage							
4	Recruitment of labour force	Community income improvement Labours will be recruited exclusively from local community, and semi-skilled labour will be recruited preferentially from such communities, provided that they have the requisite qualification, competence and desired experience.	Construction stage/Production	Positive/opportunity	1=opportunity	The participation of local community members will be maximised during site preparation and construction activities.	Contractor/Unops
		Social conflict	Construction stage/Production	Negative/risk	2=low risk	Give preference to locals when recruiting labour force	Contractor/Unops
5	Child labour	child can be seriously injured during construction stage	Construction stage/Production	Negative/risk	3=medium risk	Contractor will not employ a child	Contractor/Unops
6	Use of labor intermediaries to recruit workers	<ul style="list-style-type: none"> • wide-spread practice in local market engaged workers through intermediaries • Non-payment of minimum wage • incomplete payment of wages intermediaries to workers 	Construction stage/Production	Negative/risk	4=high risk	<ul style="list-style-type: none"> • Develop policies on remuneration, working conditions and workers' accommodation for workers conforming to national labor laws • Communicate policies to labor intermediaries and make sure they understand • Make policies contractually binding under the service agreement with labor intermediaries • Appoint a team of company's supervisors to physically observe payment of wages to workers by labor intermediaries and inspect workers' accommodations 	Contractor/Unops
7	Community Conflict.	Influx of workers and strangers in the community will result to theft issues and all potential Gender Based Violence	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Contractor will do community engagement • UNOPS will establish Grievance Redress Mechanisms committee in each beneficiary community • Proper management of project information, expectation and outcomes to the community people will be ensured • The contractor and workers will avoid unnecessary socialization with the community members 	Contractor/Unops


8	Community Health and Safety issues.	Leaving dug holes unattended can create new potential hazards where children or less-abled people could accidentally fall into an open drain containing very sharp objects or discharged water	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • The contractor will provide orientation for workers on construction health and safety. • There will be a restriction of too many visitors to construction sites. • The contractor will control the influx of women and children selling food stuff at construction sites. • Sharp objects and materials will be handled with care and dug holes will be labelled and given danger signs. • Dug holes will be covered before close of the day's work. • They must avoid GBV (Gender Based Violence) activities • The contractor will establish good relationship with the community 	Contractor
8	Occupational Health and Safety	Employers have to take the necessary measures for the safety and health protection of workers, including prevention of occupational risks Workplace-related health impairments, injuries and illnesses cause great human suffering and incur high costs, both for those affected and for society as a whole. Occupational health and safety measures and health promotion in workplaces are aimed at preventing this	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Contractor will provide health and safety training for all workers prior to construction • Appropriate use of equipment especially for those use for climbing, electricity tools etc. • The contractor will provide and orientate each worker with PPE and for visitors • Contractor will ensure the use of only materials which have an appropriate permission. • The contractor will provide information on health and safety at site. • The site supervisor will ensure usage of the PPE • Contractor will provide proper lighting if working at night • The contractor will provide OHS plan • The contractor will provide a first Aid kit at the site. • And provide water for drinking at site 	Contractor
10	Dust generation	<ul style="list-style-type: none"> • Inhalation of dust may lead to chest infection by workers, pedestrians and the closest objects • Discoloration of moving and stationary objects like houses, and nearby vegetables/plants 	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Workers should wear personal protective clothing such as dust masks. Wetting of the soil will be done two times a day • Use of well-ventilated work spaces for sites activities to prevent inhaling toxic fumes • Vehicles transporting sand and other dust generating materials will be fully covered • Alternatively, contractors will ensure the mapping out of vehicular routes to reduce dust to dwelling areas 	Contractor
11	Soil Erosion	Construction projects usually entail extensive land disturbance involving the removal of vegetation and reshaping of topography. Such activities make the soil vulnerable to erosion. Soil removed by erosion may become airborne and create dust problem or be carried by water into natural waterways, thereby polluting them. Due to the soil erosion of the exposed and loose earth, there will be a deterioration of water quality in the surrounding water bodies due to siltation. This can result in mud floods and flash floods in immediate or downstream areas during heavy downpours. Landslides and slope failure can occur on unstable slopes or when the soil is saturated with water during heavy rainfalls.	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Workers will ensure that surface runoff generated on impervious surfaces is not channelled directly to steep slopes. • Contractors will maintain the access roads and the work areas on a regular basis to prevent the formation of ruts, ridges and mounds that could hamper the natural flow. • The contract will ensure daily cleaning of the site with adequate waste disposal to prevent harmful substances leaking into the soil • Zones within the community susceptible to erosion and unstable soils at the beginning and end of the drain would be avoided. <p>During construction Contractor</p> <ul style="list-style-type: none"> • The contractors will direct the surface run-off and drainage waters so that they do not go around sections where the soil is susceptible to erosion. If they cannot be diverted, the contractor/engineer will implement protective measures (such as berm, diversion channels etc) 	Contractor

13	Cement/concrete works	Dust emission	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Provide workers with appropriate PPE • Store waste water and remove it from site to approved waste water collector • Consider the usage of mats for concrete mixing 	Contractor
		Potential contamination to rainwater drainage system	Construction stage/Production	Negative/risk	3=medium risk		
14	Painting works	Air quality	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Provide a proper ventilation • Consider using water-base paint products • Provide workers with appropriate PPE • Provide worker with training • Consider enclosing the working area • Provide adequate ventilation • Inform people about the work 	Contractor
		Contractor health	Construction stage/Production	Negative/risk	3=medium risk		
		Community disturbance	Construction stage/Production	Negative/risk	2=low risk		
15	being struck by heavy equipment	Injuries/Fatalities due to being struck by heavy equipment	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Develop occupational health and safety policy regarding the use of heavy equipment; communicate policy to managers, supervisors and workers • Plan a drive-through site to eliminate the need for vehicles to back up • Establish designated pedestrian routes through worksites and use signs to indicate them • Prevent unauthorized workers or bystanders from entering a danger zone; when appropriate, install barricades and signs around the danger zone 	Contractor
16	Demolition/renovation works	Dust emission Respiratory illnesses among local villagers	Construction stage/Production	Negative/risk	3=medium risk	Use water to suppress the flying dust	Contractor
		Contractor worker's health	Construction stage/Production	Negative/risk	3=medium risk	Provide workers with appropriate PPE Provide worker with training Consider enclosing the working area Provide adequate ventilation	
		Community disturbance	Construction stage/Production	Negative/risk	3=medium risk	Consider carrying out activities with intensive noise to during least disruptive time Inform people about the work	
17	Steel works	Fume emission	Construction	Negative/risk	3=medium risk	Provide adequate ventilation	Contractor
		Contractor worker's health	Construction	Negative/risk	3=medium risk	Provide workers with appropriate PPE	
18	Storage of or handling fuel/chemicals	Potential for leakage or spill	Construction stage/Production	Negative/risk	3=medium risk	Store chemicals, oil, fuels and toxic fluids in designated hard standing areas Provide a containment that is 110% of the storage capacity Ensure spill kit is available in site Provide workers with training	Contractor
19	Fire and explosion	Removal of hydrocarbon-based substances (e.g. petroleum fuels/oils) for example from old industrial buildings used for fuel storage can present a risk of fire/explosion	Construction stage/Production	Negative/risk	2=low risk	Conduct fire hazards identification Develop emergency response plan	Contractor
		Community disturbance	Construction stage/Production	Negative/risk	2=low risk	Provide workers with training	
20	Emission from equipment and vehicle operating	Air pollution emission,	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> • Maintain Construction equipments, machines to minimize the emission, use well trained maintenance staff when changing oil of the equipment outside worksite, in workshops. • Workers will wear personal protective clothing such as dust masks. • Contractors will ensure proper maintenance of machines and vehicles regularly. 	Contractor
		Environmental pollution	Construction stage/Production	Negative/risk			

21	Non Hazardous waste generation	<p>Personnel working in UNOPS offices, products procured by UNOPS and construction sites produce significant amounts of waste</p> <p>Health risks caused by a variety of diseases, traffic congestion, conflicts with construction firms, closing drainage, and leading to floods and waste transported by rainwater are some of the main social impacts of construction waste.</p> <p>In addition, as a by-product of construction work, waste creates negative environmental impacts, which includes soil contamination, water contamination, energy and natural resources consumption, environmental degradation, and landscape deterioration</p>	Construction stage/Production	If not properly separated and recycled, waste accumulates in scarce landfills, generates hazardous leakages and emits methane; in the worst case scenarios, it is dumped uncontrolled into the environment	3=medium risk	<ul style="list-style-type: none"> ● Implement waste segregation and waste management plan at every office and project site. ● Liaise with local suppliers and other UN agencies to explore more sustainable waste solutions at local level. ● Contractor will do housekeeping i.e., frequently cleaning the site. ● They will sort out the waste and will give all reusable material to community people in need. This will maximize the rate of recycling of waste. ● All wastes containers and areas will be properly mapped and labelled. ● Incorporating recyclable materials to reduce the volume and cost of new concrete mixes. ● Contractor will provide trash can for canteen waste at the site. ● All construction waste will be transported to the Licences/approved community landfill or dump sites. ● Ensure there is documented evidence of proper disposal of solid waste including construction debris. ● all medical wastes would be managed using incinerator 	Contractor/Unops
22	Hazardous waste Generation	<p>Used oil, hydraulic oil spillage, paint, fuel during operation of construction Equipment.</p> <p>improper collection, segregation and disposal of Hazardous waste.</p> <p>Disposal of hazardous waste material is not properly planned (e.g. mosquito nets, solar panels, asbestos, oil)</p>	Construction stage/Production	<p>Negative/risk</p> <p>Hazardous material are released into the environment and affect people's health</p>	3=medium risk	<p>Training drivers and operators and workers on contamination prevention measures (oil, paint, fuel, etc.).</p> <p>Raise awareness on land and soil protection</p> <p>Provide MSDS (Material safety data sheet) for all hazardous materials and follow the protection measures and PPE recommendations</p>	Contractor/Unops
23	Wastewater generation	<p>Untreated water discharges from UNOPS sites and uncontrolled/accidental spills reach water courses</p> <p>Discharges of used water sewage (from toilets, kitchen, bathrooms)</p>	Construction stage/Production	Waste water discharges and spills affect water quality and damage aquatic ecosystems; quantity and quality of drinking water is affected	3=medium risk	Ensure secondary containment of dangerous liquids is implemented on project sites as minimum standard. Recycle wastewater.	Contractor/Unops
24	Flora and Fauna	Cutting trees are not allowed by Local Laws	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> ● Contractor/workers will avoid removal of vegetation and shrubs in adjacent areas ● They will clear only areas assigned for works. <p>Planting of trees and flowers will be recommended</p>	Contractor/Unops
25	Hazardous/toxic material from cements dust	Respiratory illnesses among local villagers	Construction stage/Production	Negative/risk		<ul style="list-style-type: none"> ● Workers will always put-on nose masks ● They will also wear PPE always during working hours 	Contractor/Unops
26	Land Use	<p>Land uses within each of the construction project study areas largely comprise a range of residential, agricultural, open space, commercial, industrial and quarrying, community facilities, and transport and infrastructure-based land uses.</p> <p>The most significant potential land use impacts arising from the construction projects:</p> <ul style="list-style-type: none"> ● Disruption to existing surface land uses during construction ● Changes to the built environment within the study area, including constraints to access to properties within the proposed project boundary ● Extent of land acquisition and occupation across each precinct and the study area as a whole, and the impact this may have on land use change 	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> ● Backfill and Compaction: at the end of the day's work, the contractor will backfill with the soils and compact along the drains and level the surroundings whilst keeping the construction area tidy and safe for community use. ● Contractor will negotiate with communities for space for loading and unloading of material and mixing of concrete if the land space assigned to the project is not sufficient to serve such purpose. 	Contractor/Unops

27	Noise and vibration impacts	Construction works will cause significant noise and vibration impacts to community, due to the use of rehabilitation equipment like excavators, trucks, generators etc.	Construction stage/Production	Negative/risk	3=medium risk	<ul style="list-style-type: none"> ● Avoid night time rehabilitation when noise is loudest. ● Avoid night-time rehabilitation using heavy machinery, from 22:00 to 6:00 near residential/ patients areas. ● Undertake works at suitably agreed times that do not impact the community adversely ● No discretionary use of noisy machinery within 50m of residential areas and near institutions were possible, manual labour can be used at this point. ● Good maintenance and proper operation of machinery to minimize noise generation. and provide PPE for workers where necessary. ● Where possible, ensure non-mechanized construction to reduce the use of machinery ● Undertake regular maintenance of soundproof generators. ● Contractors should maintain a noise level that does not exceed 85 decibels (dB). <p>Observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines when not in use</p>	Contractor
28	Electricity production	Fossil fuel are burned on site by generators release GHG emissions to atmosphere	Construction stage/Production	Contribute to global warming temperature	4=high risk	Use of renewable energy. Regular awareness to reduce the electricity consumption,	Contractor
29	Transportation	Transport and logistic operations around office and projects	Construction stage/Production	Creation of noise, traffic congestion, raise dust and light pollution	2=low risk	Reduce travel whenever possible and engage in video conferences, google or skype meetings. Encourage to use carpooling	Contractor
Use operation stage							
30	Air conditioning	Use of high ODP refrigerants that leak into the atmosphere	Use/Operations	Contribution to depletion of the ozone layer	3=medium risk	Progressively phase out HCFC equipment - provide guidance on selection of preferable refrigerant systems	Ministry of Health
31	Use of local utilities	High consumption of fossil fuel, water and electricity	Use/Operations	Pressure on local supply sources in competition with local population	3=medium risk	Use energy efficient machinery and appliances , reduce travel, use carpooling . Identify wasteful usage patterns.	Ministry of Health
32	Air emissions from hospital waste incinerators	potential pollution risks associated with entering emissions to environment through air-conditioning ducts and windows	Use/Operations	Air pollution - Negative/risk	3=medium risk	<p>reduction of waste generated and sorting of wastes at the source good incinerator design to ensure optimal combustion conditions:</p> <p>extension of the chimney (if the height of the chimney is doubled from 3 to 6 metres, the concentrations of pollutants in the air are 5 to 13 times lower) installation of incinerators far from inhabited or cultivated areas;</p> <p>best operating practices: appropriate startup and cooling, care to obtain a sufficiently high temperature before feeding the wastes in, adherence to the correct quantity of waste and fuel, regular removal of ash;</p> <p>emission control: emissions must not exceed the national limit values and they must comply with the BAT/BEP1817 recommendations set forth in the Stockholm Convention.</p>	Ministry of Health
33	Rehabilitation of the medical facility	Medical services improvement	Use/Operations	Positive/opportunity	1=opportunity	No action required	Ministry of Health
		Community economic improvement	Use/Operations	Positive/opportunity	1=opportunity	No action required	

34	Operational Waste Management (Solid, semi-solid, and liquid)	Disposal of Hazardous waste eg. small batteries, vehicle batteries, light tubes, lubricants oil, Electronic waste	Use/Operations	in case released into the environment they will affect health's problems and impact the fauna and flora.	3=medium risk	<p>The design provides for management of solid, semi solid and liquid medical and non-medical wastes that will be generated during the service period of the facility in accordance with local norms and codes.</p> <p>These facilities include:</p> <ul style="list-style-type: none"> - Non-medical solid waste store: to accumulate nonmedical solid waste for transportation and disposal to a nearby dump site outside of the facility. - Incinerator: For incineration of hazardous medical wastes. - Ash pit: for disposal of incinerated materials - Sharp pit: for the disposal of sharp materials like needles, surgical blades, etc. - Septic tank: for the storage and partial treatment of faecal sludge from WCs. - Engineered soak-away pit: for the storage and biological treatment of grey water - Infiltration enhanced pavements: to allow for infiltration of large volumes of storm water. - Stormwater drainage: for the channeling and disposal of excess non-contaminated stormwater into the nearby wetland. 	Ministry of Health
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			Register of environmental and social risks - EM 04 <small>© UNOPS 2017, v 2.2</small>			
			Instructions - All fields are mandatory 1: Activity: Shortly describe all main activities that take place in the office/project. 2: Environmental/Social aspect: Describe the environmental and/or social aspects that interacts with the environment and with the society. Note that one activity can potentially entail more than one environmental and/or social aspect. 3: Lifecycle stage: Indicate at which stage of the lifecycle of a product/service this aspect is occurring. 4: Potential impact: Describe the risk or opportunity that will occur in the environment and/or society due to this aspect. 5: Significance: Select the significance of the risk. 6: Action required: Describe what action(s) could be taken to address this risk, either for mitigation of a threat or for enhancement of an opportunity.			
			Office/Project:		Date:	
#	Activity	Environmental/Social aspect	Lifecycle stage	Potential Impact (negative/risk or positive/opportunity)	Significance	Action required (mitigation or enhancement)
	Inadequate design		Design		3=medium risk	
1	Air conditioning	Use of high ODP refrigerants that leak into the atmosphere	Use/Operations	Contribution to depletion of the ozone layer	3=medium risk	Progressively phase out HCFC equipment - provide guidance on selection of preferable refrigerant systems
2	Recruitment of labour force	Community income improvement	Production	Positive/opportunity	1=opportunity	No action required
		Social conflict	Production	Negative/risk	2=low risk	Give preference to locals when recruiting labour force
3	Rehabilitation of the medical facility	Medical services improvement	Use/Operations	Positive/opportunity	1=opportunity	No action required
		Community economic improvement	Use/Operations	Positive/opportunity	1=opportunity	No action required
4	Sanitation works	Contractor health	Production	Negative/risk	3=medium risk	Provide workers with appropriate PPE Provide worker with training Consider enclosing the working area Provide adequate ventilation Inform people about the work
5	Cement/concrete works	Dust emission	Production	Negative/risk	3=medium risk	Store waste water and remove it from site to approved waste water collector
		Potential contamination to rainwater drainage system	Production	Negative/risk	3=medium risk	
6	Painting works	Air quality	Production	Negative/risk	3=medium risk	Consider using water-base paint products
		Contractor health	Production	Negative/risk	3=medium risk	Provide workers with appropriate PPE
		Community disturbance	Production	Negative/risk	2=low risk	Provide worker with training Consider enclosing the working area Provide adequate ventilation
7	Demolition/renovation works	Dust emission	Production	Negative/risk	3=medium risk	Use water to suppress the flying dust Provide workers with appropriate PPE
		Contractor worker's health	Production	Negative/risk	3=medium risk	Provide worker with training Consider enclosing the working area Provide adequate ventilation
		Community disturbance	Production	Negative/risk	3=medium risk	Consider carrying out activities with intensive noise to during least disruptive time Inform people about the work
8	Steel works	Fume emission	Production	Negative/risk	3=medium risk	Provide adequate ventilation
		Contractor worker's health	Production	Negative/risk	3=medium risk	Provide workers with a propriate PPE

9	Storage of or handling fuel/chemicals	Potential for leakage or spill	Production	Negative/risk	3=medium risk	Store chemicals, oil, fuels and toxic fluids in designated hard standing areas Provide a containment that is 110% of the storage capacity Ensure spill kit is available in site Provide workers with training
10	Inappropriate waste disposal	Potential contamination to soil	Production	Negative/risk	3=medium risk	Follow site water management plan Store waste at a designated area
		Potential contamination to rainwater drainage	Production	Negative/risk	3=medium risk	
		Community disturbance	Production	Negative/risk	3=medium risk	
11	Fire and explosion	Emission to air	Production	Negative/risk	2=low risk	Conduct fire hazards identification
		Community disturbance	Production	Negative/risk	2=low risk	Develop emergency response plan Provide workers with training
12	Exhaust Air system	Air pollution emission,	Production	Negative/risk	3=medium risk	Maintain Construction equipments, machines to minimize the emission, use well trained maintenance staff when changing oil of the equipment outside worksite, in workshops.
		Environmental pollution	Production	Negative/risk		
13	Waste generation	Personnel working in UNOPS offices, products procured by UNOPS and construction sites produce significant amounts of waste	Production	If not properly separated and recycled, waste accumulates in scarce landfills, generates hazardous leakages and emits methane; in the worst case scenarios, it is dumped uncontrolledly into the environment	3=medium risk	Implement waste segregation and waste management plan at every office and project site. Liaise with local suppliers and other UN agencies to explore more sustainable waste solutions at local level.
14	hazardous waste Generation	used oil, hydraulic oil spillage, paint, fuel during operation of construction Equipment. improper collection, segregation and disposal of Hazardous waste. Disposal of hazardous waste material is not properly planned (e.g. mosquito nets, solar panels, asbestos, oil)	Production	Negative/risk Hazardous material are released into the environment and affect people's health	3=medium risk	Training drivers and operators and workers on contamination prevention measures (oil, paint, fuel, etc.). Raise wareness on land and soil protection Provide MSDS (Material safety data sheet) for all hazardous materials and follow the protection measures and PPE recommendations
15	Hazardous waste generation	Disposal of Hazardous waste eg. small batteries, vehicule batteries, light tubes, lubricants oil, Electronic waste	Use/Operations	in case released into the environment they will affect health's problems and impact the fauna and flora.	4=high risk	A waste management plan is developped by the contractor.
17	Non Hazardous waste generation	Generation of Domestic waste (foods, plastic, paper, cardboard...) and Inert waste (metal, wood) generated by UNOPS staff	Production	if not segregated and disposed of into public landfill will generate hazardous leakages and emits methane, and will be harmful to the fauna and flora	3=medium risk	Implement waste management plan and promote the waste segregation culture by providing regular awareness and different bins. Encourage the reduction, reuse and recyle best practices. Phase out the use of plastic bottles
18	Wastewater generation	Untreated water discharges from UNOPS sites and uncontrolled/accidental spills reach water courses Discharges of used water sewage (from toilets, kithen, bathrooms)	Production	Waste water discharges and spills affect water quality and damage aquatic ecosystems; quantity and quality of drinkin water is affected	3=medium risk	Ensure secondary containment of dangerous liquids is implemented on project sites as minimum standard. Recycle wastewater.

20	noise quality impacts Noise and vibration impacts	due to the use of rehabilitation equipment like excavators, trucks, generators etc	Production	Negative/risk	3=medium risk	<p>Avoid night time rehabilitation when noise is loudest. Avoid night-time rehabilitation using heavy machinery, from 22:00 to 6:00 near residential/ patients areas.</p> <p>No discretionary use of noisy machinery within 50m of residential areas and near institutions were possible, manual labour can be used at this point.</p> <p>Good maintenance and proper operation of machinery to minimize noise generation. and provide PPE for workers where necessary.</p> <p>Where possible, ensure non-mechanized construction to reduce the use of machinery</p> <p>Undertake regular maintenance of soundproof generators.</p> <p><i>Undertake works at suitably agreed times that do not impact the community adversely</i></p> <p><i>Observe a common-sense approach to vehicle use, and encourage drivers to switch off vehicle engines when not in use</i></p>
21	Electricity production	Fossil fuel are burned on site by generators release GHG emissions to atmosphere	Production	Contribute to global warming temperature	4=high risk	Use of renewable energy. Regular awareness to reduce the electricity consumption,
22	Transportation	Transport and logistic operations around office and projects	Transportation/Delivery	Creation of noise, traffic congestion, raise dust and light pollution	2=low risk	Reduce travel whenever possible and engage in video conferences, google or skype meetings. Encourage to use carpooling
23	Use of local utilities	High consumption of fossil fuel, water and electricity	Use/Operations	Pressure on local supply sources in competition with local population	3=medium risk	Use energy efficient machinery and appliances , reduce travel, use carpooling . Identify wasteful usage patterns.
	Air emissions from hospital waste incinerators					

Health, Safety, Social & Environmental Inspection Report - Site

Project			
Person carrying out inspection			
Location		Date	

Number of Toolbox talks held since last inspection		Number of personnel on site		Incidents since last inspection	
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NOTE: It is mandatory to document at least one HSSE inspection per week. Daily HSSE inspections are highly recommended.

1. MARK THE ITEMS THAT HAVE BEEN INSPECTED
2. INCLUDE INSPECTION FINDINGS AND PRIORITY* FOR CLOSING THEM (you can also highlight best practices)

* Priority: (A1) – Immediately (A2) – Within 24 Hrs (B3) – Within 3 Days (C) – Other (state)

Category		√	Observation(s) – add rows if necessary	Responsible	Date closed
1. General site layout & welfare (incl. housekeeping)					
Consider:	Site accommodation (toilets, canteen, water, dry clothing, cleanness) Sanitary conveniences (culturally acceptable, lockable, safe and well-lit access, gender sensitive) General appearance of the worksite (clean/untidy, fencing) Materials storage (protected, tidy, stored correctly), slip, trip and fall risks (protruding bars, cable management) Security, site boundaries (clearly marked/defined, safety signage displayed, security arrangements), lighting				
2. Emergency arrangements and response					

Consider:	<p>Fire (evacuation plan, muster point marked, extinguishers, fire alarm)</p> <p>First Aid (first aiders, first aid kit – location availability), spill kits (availability, location)</p> <p>Information display (emergency plan, contacts, site rules, policies)</p>			
3. Work at height				
Consider:	<p>Scaffolding (foundation, bracings, access, handrails, toe boards, tagging)</p> <p>Mobile platforms, ladders (locking, securing, tagging)</p> <p>Fall protection (edge protection in place, fall arrest systems, openings fenced off or covered)</p>			
4. Equipment/Portable tools/Electrical appliances				
Consider:	<p>Lifting equipment and management of lifting operations (cranes, hoists, davits, slings, chains, permit)</p> <p>Tools and equipment (condition, regular checking, maintenance, storage, guards in place)</p> <p>Transformers & Power Supply (security, connection, labelling, inspections)</p>			
5. Excavations				
Consider:	<p>Excavation, trench protection (shoring, sheet piles, placement of excavated material, fencing, railing)</p> <p>Confined space (gas monitor, evacuation procedure – tripod, topman etc)</p> <p>Dewatering arrangements</p>			
6. Personal Protection Equipment (PPE)				
Consider:	<p>Use, suitability for the task (i.e. dust masks or hearing protection), condition, storage</p> <p>Manual Handling</p>			
7. Underground and overhead services				

Consider:	Identification, marking and protection			
8. Hazardous materials				
Consider:	Clear identification, labelling, storage, no smoking sign, asbestos Gas Cutting/welding (welding screens, flashback arresters, condition of the gas bottles and hoses, permit)			
9. Traffic management				
Consider:	Planning, Routing, Turning areas, Delivery Management, Unloading area, Pedestrian Segregation, Access, Signage and traffic control, plan display, banksman Segregation of pedestrians and workers from vehicles			
10. Mobile plant equipment				
Consider:	Equipment safe and well-functioning (brakes, horn, reverse alarm, indicators, headlights and mirrors, tyres, hydraulic systems) Radio communication procedures Maintenance and daily checks Segregation from pedestrians			
11. Risk Assessment and Method Statement (RAMS)				
Consider:	Work carried out according to RAMS, communication to workers			
12. Lifting appliances and equipment				
Consider:	Radio communication system with cranes, outriggers, Safe Working Load (SWL) clearly marked			

13. Waste management and segregation				
Consider:	Waste segregation, availability of bins/skips/containers properly labelled, secured and protected i.e. from rain, animals Frequency of emptying bins, waste disposal/recycling according to plan Separate, secure storage of hazardous waste in sealed, non-leaking, bunded area			
14. Fuel/oil/chemical storage				
Consider:	Fuels/chemicals/oils storage in bunded areas, use of drip trays, good condition of the drums and bund Designated refuelling area on site, located away from watercourse, bunded or on hard surface Gas storage in secure/lockable area; labelling and signage			
15. Drainage, dewatering, spillage control				
Consider:	Uncontrolled discharges to watercourses/drainages; storm water drainage; control of dewatering or overpumping activities; use of settlement tanks and/or oil separators Check for leaking equipment; use of drip trays; concrete wash out site; designated vehicles wash-down area (connected to drainage and oil separator) Sewage system from site/canteen/office discharge			
16. Ecology, archaeology and heritage				
Consider:	Ecological, archaeological or sensitive areas, protection from site activities; affected trees or vegetation			
17. Dust and mud				

Consider:	Dust control measures, excavated material stock piles covered, dust suppression system (sprinklers), traffic control around the site controlled (speed limited) Mud spreading prevention - wheel wash, dust suppression systems on the equipment i.e. on the chain saw			
18. Odour and air emissions				
Consider:	Burnings on site, waste burning prohibited on site Odour emissions Emissions from equipment/machinery/vehicles, related maintenance			
19. Noise and vibration				
Consider:	'Noisy' equipment, maintenance, noise mitigation measures i.e. is the equipment fitted with mufflers, screens, noise monitoring			
20. Labour relations; Community interface				
Consider:	Complaints from the neighbourhood, liaison with community/authorities Indications of child or very young workers presence, retaining salaries, other labour rights violations			
21. Prevention of gender based violence, sexual exploitation, abuse and harassment				
Consider:	Posters on prevention of GBV, SH and SEA Visible and accessible reporting channels for GBV, SH and SEA Evidence of GBV, SH and SEA training/awareness			

Name/Signature of Person carrying out Inspection:			
Approved by Project Manager		Date	

Emergency Drill Record

Project Title	
Location of the drill (address)	
Date of Emergency drill	
Time warning system was initiated	
Warning system initiated by	
Weather condition	
Emergency coordinators present	
Approximate number of people evacuated	
Time taken to fully evacuate	

Overall Standard of Emergency Drill	Unsatisfactory	Satisfactory
(tick the correct)		

Comments/findings	Action required/ Responsibility	Date completed

Name of Person in charge of the drill		Date	
Signature			

Site Waste Management Plan

Project title	
Project site	
Project Manager	
Officer responsible for environmental planning – waste management	
Brief outline of the project scope	

The table below lists the type of waste that is anticipated to be generated by the project, estimates the quantities of waste expected and establishes the appropriate waste mitigation measures that will be put in place for reducing and controlling the waste.

From data collected throughout the project duration, monitor the actual quantity of waste generated, calculating the difference and identifying the reasons for any variance.

The plan should be regularly reviewed and progress recorded to evaluate performance against planned targets/assumptions.

Waste Materials	Estimated Quantity	Reused/recycled on site		Reused/recycled off site		Landfill disposal		Notes (mitigation/control/actions)
		Planned	Actual	Planned	Actual	Planned	Actual	
Non-Hazardous Waste								
Hazardous Waste								
Organic Waste								

Additional Items for Waste Management Consideration	Action
Landfill/Disposal Site: Has the site been identified? Approved? Licensed? Acceptable to local authorities etc?	
Are hazardous material disposal facilities available and identified?	
Will a waste removal contractor be appointed? If so, are they aware of the requirements of this plan?	
Have all staff and workers been made aware of requirements of this plan for waste processing, included in the project site Induction?	
Will there be an audit and or review process of the waste management project plan? Provide details.	
Are there any specific training issues that should be undertaken to implement this plan?	
Other issues:	

Guidance and minimum requirements on waste management:

- [GEM02 Waste Management](#)
- [GEM07 Hazardous Waste Management](#)

GENDER ACTION PLAN FOR PROJECTS


Purpose: This is a template for a project-specific Gender Action Plan (GAP) which should be developed as a result of the gender screening results conducted during the Pre-engagement Stage. The GAP responds to findings from the gender analysis and other relevant information on gender-based constraints and opportunities.

Project name								
Overall project objective								
#	ACTIVITY	TARGETS	BUDGET	RESPONSIBLE	START DATE	END DATE	SUCCESS MEASURE INDICATOR	STATUS UPDATE
Project output 1		Design Development						
1.1								
1.2								
1.3								
1.4								
Project output 2		Completion of Existing Building						
2.1								
2.2								
2.3								
2.4								
Project output 3		Construction of new Buildings						
3.1								
3.2								
3.3								
3.4								
Project output #								
#.1								
#.2								
#.3								
#.4								

Name of Office:	
Year:	

Instructions:
Step 1: Under "Personnel information", indicate the name, title, and organization of any training participants.
Step 2: Under "HSSE training":
 a. indicate the name of any mandatory, planned, and implemented health, safety, social and environmental training - both online and face-to-face, and for both offices and projects.
 b. indicate the date that the training was taken by the relevant personnel.

Personnel information				HSSE training							
#	Name	Title	Organization	[Name of training 1]	[Name of training 2]	[Name of training 3]	[Name of training 4]	[Name of training 5]	[Name of training 6]	[Name of training 7]	[Name of training 8]
				Indicate below the date that the training was taken [DD-MM-YYYY]							
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 <div>UNOPS</div>		Health, Safety, Social & Environmental Inspections QUARTERLY REPORT - project <small>© UNOPS 2018, v 1.0</small>																											
		Project office																											
		Project name & oU number																											
		Reporting period						to																					
SIGNIFICANT OCCURRENCES IN THE REPORTING PERIOD:																													
Class 1 incidents										Class 2 incidents																			
# HS Toolbox talks held										# SE Toolbox talks held										Other									
# of OBSERVATIONS IN THE REPORTING PERIOD - PER CATEGORY																													
1. General site layout and welfare	2. Emergency arrangements	3. Work at height	4. Equipment/portable tools	5. Excavations	6. PPE	7. Underground / overhead services	8. Hazardous chemicals	9. Traffic management	10. Risk assessment	11. Lifting appliances	12. Waste management	13. Fuel / oil / chemical storage	14. Drainage, dewatering, spill control	15. Ecology, archeology and heritage	16. Dust and mud	17. Odour and air emissions	18. Noise and vibration	19. Labour relations, community interface											

Add a series to start visualizing your data

Incident Report Form

2) For each type of incident, select the relevant descriptor(s) from the list. You can select up to 5 descriptors for each type of incident. If a descriptor is not listed below, please type in short descriptor in "Other". Add more rows as necessary.

Project/Office			Incident type	Descriptor 1	Descriptor 2	Descriptor 3	Descriptor 4	Descriptor 5	Other
Report date			H&S						<i>Please type in short descriptor here</i>
Reported by		Title/role							
I. DETAILS OF THE INCIDENT			Environmental						<i>Please type in short descriptor here</i>

Incident date			Provide description of the immediate causes of the incident:
Incident time			
Incident place			

Incidents are classified into two classes, as below. You can select either Class 1 or Class 2, not both. Select the Class that better describes the type of incident. You can select multiple sub-categories under each class.

Incident class	Category 1	Category 2	Category 3	Category 4	Category 5
Class 1					
Class 2					

III. DESCRIPTION OF THE INCIDENT

Record all facts prior to and including the incident, if it was a planned activity, describe/list material, ecosystem and property damaged, etc:

II. IDENTIFICATION OF TYPE OF INCIDENT AND IMMEDIATE CAUSES

1) Select the type of the incident from the list below. An incident can be classified at the same time as H&S/environmental/social.

Type of Incident - H&S		Type of Incident - Social
Moving Machinery/vehicles at project site	Dust, Fumes, Vapours	Misuse of UNOPS property
Fall from height	Noise	Damage to Cultural Heritage
Powered Hand tools	Temperature or heat	Occurrence of infringement of labour rights
Hand Tools	Overexertion	Occurrence of infringement of human rights
Animals or insects	Structural Failure	Stakeholder/community complaint
Fire or Explosion at project site	Chemical/biological	Strike, demonstration
Trips & smaller falls	Stress	Other (please specify)
Drowning	Other (please specify)	
Borrow-pit Management		

Type of Incident - Environmental	
Chemical/Oil Spill	Damage to ecosystems (e.g. damage to flora/fauna)
Improper Disposal Waste	Odour air Emissions
Disasters (Earthquake, Flood, etc)	Dust, Fumes, Vapours, Air pollution
Water Pollution/ Sedimentation	Other (please specify)

* note that incidents related to terrorism, civil unrest, armed conflict and crime; as well as fire, aviation safety and road transport, are under the responsibility of the UN Security Management System, and should be reported to UN Security using the security incident form. Incidents at contractor operated project sites should be reported through this incident report form.

IV. ROOT CAUSE ANALYSIS

Select the root cause(s) of the incident from the list below. If "Other" please specify.

Root causes	Yes	No
Improper Planning		
Poor Maintenance		
Poor Supervision		
Poor Quality of Equipment		
No rules, standards, or procedures		
Lack of knowledge or skills		
Improper motivation or attitude		
Failure to comply with rules		
Other		

Incident Review Report

Project/Office			
Review completed on		Reference to incident report	
Incident reviewer/ review team members	[For Class 1 incidents, include names of members of the review team and indicate the lead reviewer.]		

I. DETAILS OF THE INCIDENT

Incident classification	Class 1	<input type="checkbox"/> Fatal <input type="checkbox"/> Lost time <input type="checkbox"/> Major Environmental <input type="checkbox"/> Major Property Damage <input type="checkbox"/> Reportable Social	
	Class 2	<input type="checkbox"/> Minor Environmental <input type="checkbox"/> Minor Injury/Illness <input type="checkbox"/> Minor Property Damage <input type="checkbox"/> Near miss	
Incident Date		Incident Time (Approx.)	
Incident Place			
Description/What Happened (Record all facts prior to and including the incident that can help clarifying its dynamics and its causes)			
Photos attached	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Witness (if any), name and contact details			
Witness Statement attached	<input type="checkbox"/> Yes <input type="checkbox"/> No		

II. DETAILS OF HARMED PERSON(s) (Only for Health & Safety Incidents. For other type of incident, proceed to Step III.)

Name		Age	
Address/Contact details			
Occupation		Employer	
Status	<input type="checkbox"/> Contractor Employee <input type="checkbox"/> Subcontractor employee <input type="checkbox"/> Visitor <input type="checkbox"/> UNOPS Employee <input type="checkbox"/> Public <input type="checkbox"/> Other		
Date injury reported		To Whom Reported	
Did person return to work the same day?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Treatment of injury	<input type="checkbox"/> None <input type="checkbox"/> On Site First Aid only <input type="checkbox"/> Doctor <input type="checkbox"/> Hospitalised		
Details of treatment			
Were any emergency services in attendance?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Details of emergency services if in attendance			
Injury Details Injury type: (e.g. cuts/abrasions, bruising, sprain/strain, fracture, dislocation, unconsciousness, other) Body part:			
Date of return to work			

III. OUTCOME OF INVESTIGATION

Immediate cause What unsafe/inappropriate acts or conditions caused the event? Note contributing factors that have made the incident worse (e.g. incorrect use of ladder, lack of PPE, absence of drip trays/containment)	
Secondary cause What human, organisational or job factors contributed/caused the event (e.g. poor housekeeping, poor planning, incorrect work method, lack of supervision/training, improper attitude, lack of hazard control etc.)? Also review the adequacy of risk assessments.	
Lessons learned	
Preventative actions What recommended actions are needed to address and prevent the recurrence of similar incidents (eg. training of personnel, improve hazard/ impact identification, improve hazard/impact control, increase supervision, improve risk/impact assessment, discussion during HSSE meeting, etc.)?	
Preventative action(s) to be carried out by (Name of responsible person and target completion date)	
Close out (Agreed actions have been completed and situation now is satisfactory)	<i>[Before closing out, ensure that the preventative action has been implemented for a reasonable period of time and it is showing to be effective.]</i>

Signature of lead reviewer		Date	
----------------------------	--	------	--

Incident Highlight Report

Incident Classification	Class 1	<input type="checkbox"/> Fatal <input type="checkbox"/> Lost time <input type="checkbox"/> Major Environmental <input type="checkbox"/> Major Property Damage <input type="checkbox"/> Reportable Social	
	Class 2	<input type="checkbox"/> Minor Environmental <input type="checkbox"/> Minor Injury/Illness <input type="checkbox"/> Minor Property Damage <input type="checkbox"/> Near miss	
Incident Date		Incident Place	
Incident Description and Lessons learned			

Register of Interested Parties

Office/Project	
Location	
Revision and date	

“Any persons or organisations that can affect, be affected by or perceive itself to be affected by UNOPS decisions and/or activities”

Step 1: List interested parties (e.g. beneficiaries, communities, suppliers, NGOs, donors, regulators, our personnel, partners, etc.)

Step 2: Describe how you will determine their requirements (i.e. their needs and expectations)

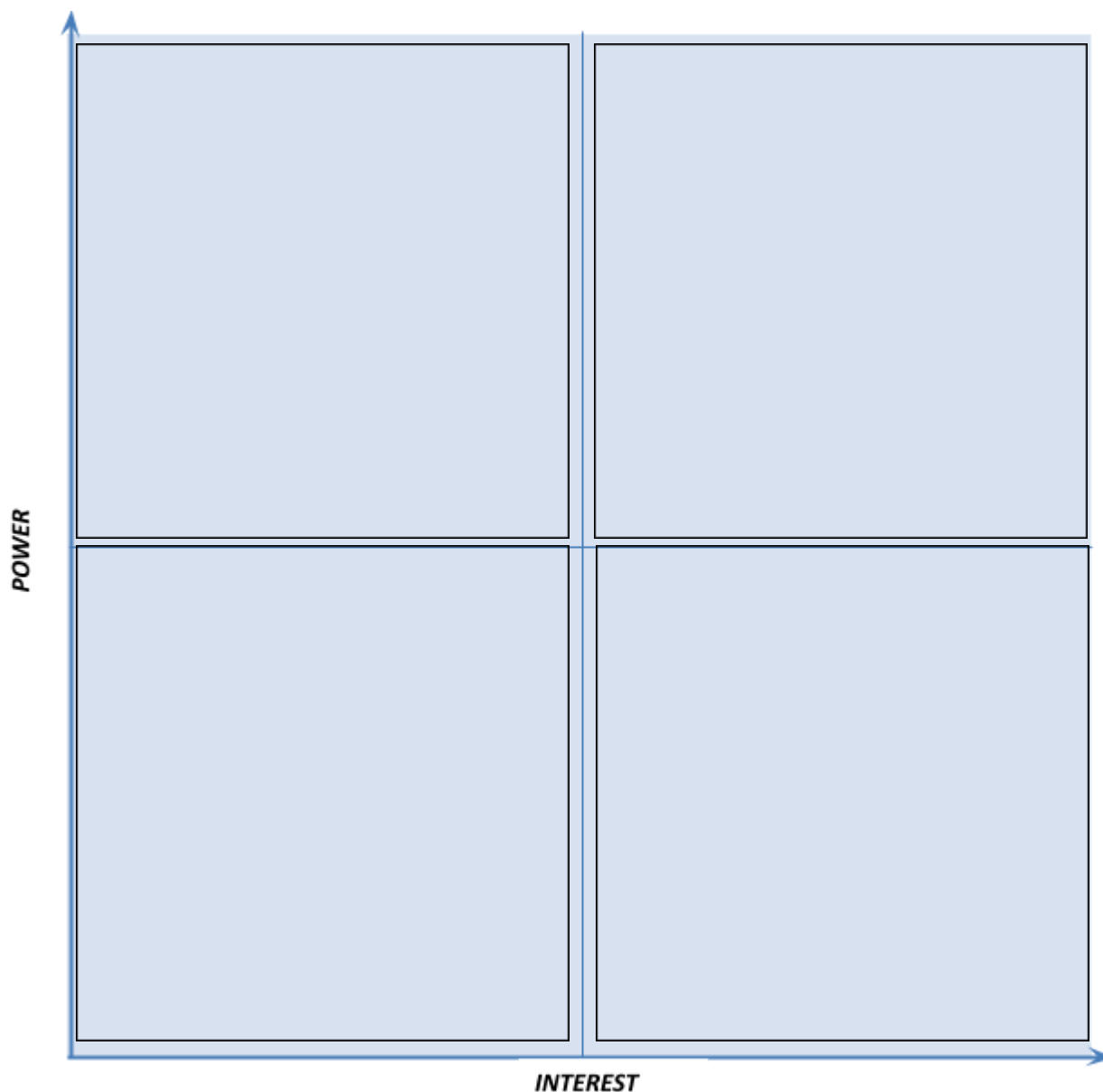
Step 3: List the requirements you have identified, and highlight those that will become compliance obligations (NOTE: make sure you include compliance obligations in the Legal Register, HSE03)

1. List of interested parties and methodology for determining requirements

Interested party	Requirement	Requirement identified by way of
1.		
2.		
3.		
4.		
5.		
6.		
7.		

8.		
9.		
10.		

2. Determination of compliance obligations for Enter the name of your office based on a power/interest grid analysis



3. Identified compliance obligations must be reported in the Legal Register (form HSE03)

Legal Register for Health, Safety and Environment

Office/Project	
Location	
Revision and date	

I. Introduction

UNOPS premises are protected by the Immunities and Privileges of the United Nations. These immunities also apply to UNOPS staff. It is the intention of UNOPS to ensure that operations do not operate below the standard of local legislation (see the UNOPS Health and Safety policy and the UNOPS Environmental Policy). Contractors and construction sites have an even higher obligation to meet legal and other obligations as they are incorporated under local laws. The contractors are assumed to have control over their ability to meet local legislation at UNOPS construction sites. UNOPS has the role of enforcing legal and other requirements in line with the UNOPS policy commitment.

When researching for applicable national legal HSE requirements, it is recommended that existing legislation in the following areas be explored:

Access/ Egress	Small tools
Fire/Emergency Prevention and Response	Work over water
Ergonomics	Work interactions (e.g. stress, psychosocial)
Occupational Health Stressors	Use of Lifting Machinery
Pressurised equipment	PPE
Electrical equipment	Other general H&S requirements
Hazardous substances	Water quality and management
Preparation of food	Air quality
Structures	Waste
Transportation	Resources conservation
Working at heights	Pollution control
Excavation	Other general environmental requirements

II. Legal Register

No	Legislation/Requirement	Source	Requirements
1	United Nations, Occupational Safety and Health Management System	ST/SGB/2018/5	The occupational safety and health management system shall be implemented in a phased manner at the central and departmental levels and shall integrate, harmonize and update existing occupational safety and health-related policies and programmes
2	A system-wide road map for United Nations climate neutrality by 2020 and of the related goals towards enhancing the environmental sustainability of United Nations operations	CEB/2015/HLCM/7 of 31 March 2015	United Nations climate neutrality by 2020 and enhancement of environmental sustainability
3	Environmental Sustainability Management in the UN System	CEB/2013/HLCM/5 of 7-8 March 2013	Development and implementation of environmental sustainability management systems in each UN organization
4	A framework for advancing environmental and social sustainability in the United Nations system	UN Environmental Management Group, 2012	Moving UN organizations towards strengthening environmental and social sustainability in our activities
5	EOD 3 "Health & Safety and Social & Environmental Policy"	UNOPS	Establish UNOPS Social, Environmental and H&S policies
6	EOI.CSG.2017.01 on Implementation of HSSE levels	UNOPS	Establishes the Health & Safety, and Social & Environmental requirements at UNOPS locations
7	EOI.CSG.2017.02 on Incident reporting	UNOPS	Establishes the requirements for reporting incidents
8	OI.PCG.2017.01 "Personnel Management Framework" on work-life balance	UNOPS	Supports personnel in balancing the demands of work and personal life
9	United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, Section D. Road Safety. 31 October 2011	UNDSS	Promotes the safe operation of United Nations vehicles world-wide, to ensure road safety and to describe the roles and responsibilities of relevant United Nations Security Management System (UNSMS) actors in improving awareness and compliance with requirements and provisions for road safety
10	OD.PCG.2017.01 "Human Resources, Ethics and Culture" on discrimination, harassment and abuse of authority	UNOPS	Ensures the workplace is free of any form of discrimination and harassment
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III. References

1. Convention Immunities and Privileges of the United Nations.
https://treaties.un.org/doc/Treaties/1946/12/19461214%2010-17%20PM/Ch_III_1p.pdf
2. <http://www.un.org/en/ecosoc/docs/2010/res%202010-23.pdf>
3. ILO: Safety and Health in Construction Convention no. 167 (Dec. 2014)
http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312312
4. ECOLEX, the gateway to environmental law, operated jointly by FAO, IUCN and UNEP
<http://www.ecolex.org/start.php>
5. NATLEX, the ILO database of national labour, social security and related human rights legislation
http://www.ilo.org/dyn/natlex/natlex4.home?p_lang=en
6. LEGOSH, the ILO global database on occupational safety and health legislation
<http://www.ilo.org/dyn/legosh/en/f?p=LEGPOL:1000>
7. United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, D. Road Safety. 31 October 2011,
https://www.un.org/undss/sites/www.un.org.undss/files/docs/security_policy_manual_spm_e-book_as_of_29_nov_2017_0.pdf
8. ST/SGB/2018/5 United Nations, Occupational Safety and Health management System
- 9.

Check for compliance requirements for Health, Safety and Environment

Office/Project	
Location	
Revision and date	

I. Immunities and Privileges of the United Nations

The founding Charter of the United Nations provides for the privileges and immunities “necessary for the fulfilment of its purposes.” (Article 105, UN Charter). The Convention on Immunities and Privileges adopted by the General Assembly of the UN on 13 February 1946 details the specifics of these legal exemptions.

This means that while UNOPS as a separate entity of the United Nations is exempt from compliance with local laws, it does interact with local governmental agencies for the provision of services and should meet the minimum standards for the operation of these services if not exceed them according to international standards.

II. UN requirements and UNOPS HSE minimum standards

The regulations and requirements put forth in the UN system should be applied to UN facilities. Therefore, UNOPS shall meet the requirements of the UN Occupational Safety and Health Management System (ST/SGB/2018/5 of 20 July 2018); of the UN Climate Neutrality Strategy and the

Strategic Plan for Environmental Sustainability Management (CEB/2013/HLCM/2); and the UN Roadmap towards Climate Neutrality by 2020 (CEB/2015/HLCM/7 of 31 March 2015); and of other relevant UN initiatives and frameworks.

UNOPS minimum standards for Health, Safety and Environment apply in all its projects and operations, also in cases where they go beyond and above local legislative requirements.

III. Check for compliance requirements

Item ¹	Legislative instrument (law, regulation, decree, etc.)	Area of concern/hazard regulated	Year	Regulatory Body	Requirements	Compliance (Y/N)	Evidence of Compliance/ Corrective Actions
1	ST/SGB/2018/5 United Nations Occupational Safety and Health Management System	Other general HS requirements	2018	UN	The occupational safety and health management system shall be implemented in a phased manner at the central and departmental levels and shall integrate, harmonize and update existing occupational safety and health-related policies and programmes.	Y	HSSE team is leading corporate implementation of the system / UNOPS progress is aligned with the system
2	A system-wide road map for United Nations climate neutrality by 2020 and of the related goals towards enhancing the environmental sustainability of United Nations operations	Other general Environmental requirements	2015	UN	United Nations climate neutrality by 2020 and enhancement of environmental sustainability	Y	HSSE team accounts for corporate greenhouse gas emissions and purchases Certified Emission Offsets; Environmental sustainability is in place under the UNOPS HSSE programme
3	Environmental Sustainability Management in the UN System	Other general Environmental requirements	2013	UN	Development and implementation of environmental sustainability	Y	Environmental sustainability is in place under the UNOPS HSSE programme

¹ Ensure numbering of legislative instruments is aligned and can be cross-referenced with those included in the Legal register.

					management systems in each UN organization		
4	A framework for advancing environmental and social sustainability in the United Nations system	Other general Environmental requirements	2012	UN	Moving UN organizations towards strengthening environmental and social sustainability in our activities	Y	HSSE management systems, GRI reporting
5	EOD 3 “Health & Safety and Social & Environmental Policy”	Health, Safety, Social and Environmental requirements	2017	UNOPS	Establish UNOPS Social & Environmental and H&S policies	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
6	EOI.CSG.2017.01 on Implementation of HSSE levels	Health, Safety, Social and Environmental requirements	2017	UNOPS	Health, Safety, Social and Environmental instructions	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
7	EOI.CSG.2017.02 on Incident reporting	Health, Safety, Social and Environmental requirements	2017	UNOPS	Health, Safety, Social and Environmental instructions	Y	Part of UNOPS systems; IAIG audit internal processes and designation of HSSE levels by Regional directors
8	OI.PCG.2017.01 “Personnel Management Framework” on work-life balance	Other general HSSE-related requirements	2017	UNOPS	Support personnel in balancing the demands of work and personal life	Y	Part of UNOPS systems; IAIG audit internal processes
9	United Nations Security Management System, Security Policy Manual, Chapter VII Provisions on Safety Matters, Section D. Road Safety	Transportation	2011	UNOPS	Promote the safe operation of United Nations vehicles world-wide, to ensure road safety and to describe the roles and responsibilities of relevant United Nations Security Management System (UNSMS)	Y	UNOPS follows the UN Road Safety Strategy

					actors in improving awareness and compliance with requirements and provisions for road safety		
10	OD.PCG.2017.01 "Human Resources, Ethics and Culture" on discrimination, harassment and abuse of authority	Other general HSSE-related requirements	2017	UNOPS	Ensuring the workplace is free of any form of discrimination and harassment	Y	Part of UNOPS systems; IAIG audit internal processes
11							
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15							

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IV. References

1. Convention Immunities and Privileges of the United Nations.
https://treaties.un.org/doc/Treaties/1946/12/19461214%2010-17%20PM/Ch_III_1p.pdf
2. <http://www.un.org/en/ecosoc/docs/2010/res%202010-23.pdf>

Projects are screened for their inherent social and environmental risks regardless of planned mitigation and management measures. It is necessary to identify potential inherent risks in the event that mitigation measures are not implemented or fail. This means that risks should be identified as if no mitigation or management measures were to be put in place.

SECTION A: General Information

Project title	
Proposed project budget	
Proposed project duration	
Implementing BU	
Project manager/ Developer	
Officer responsible for social & environmental screening	
Brief outline of the project scope	
Service line	
Role	
Site/No site	

Does the project need to screen?

Environmental Review Report

Project Title	[name of project]
Donor and/or agreement number	[Donor and/or agreement number]
Date	[Date]

General Guidance for the use of the Template Environmental Review Report:

Purpose of the Environmental Review is to identify the main environmental impacts and propose mitigation measures.

Please note:

- *This is a template and is indicative, it will have to be adapted to individual project objectives and requirements (including the elimination or addition of sections)*
- *Guidance (given in italics throughout the document) focuses on the report. Additional guidance on undertaking the Environmental Assessment is given in the internal UNOPS Guidelines*
- *The outcomes of the Environmental Review should be integrated in the Project Environmental Management Plan and subsequently into the design documents, in agreement with the donor or/and implemented during construction.*

Document Circulation

Organization	Department	Person	Title

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3. Assessment Methodology	4
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4.1. Description of the site / location	4
4.2. Description of the works	4
5. Legislation and other requirements	5
6. Description of the environment	5
6.1. Description of the physical environment	5
6.2. Description of the biological environment	5
6.3. Description of the socio-economic environment	5
7. Potential impacts of the project	6
8. Analysis of the alternatives	7
9. Project Environmental Management Plan	7
10. Conclusions	13
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Executive Summary

[The Executive Summary should ideally be limited to 1 page (a maximum 3 pages). It should include main results, conclusions and any unresolved issues.]

1. Introduction

[The Introduction is essentially a description of the proposed project. This section requires information such as:

- Objective of the project, donor and beneficiaries of the project.*
- Brief summary of the justification of the project.]*

2. Assessment Scope

[Describe the scope of the assessment: what does the donor require? What are the objectives? As a minimum assessment of the environmental aspects and impacts is necessary, however other types of assessment may be required by the donor, as these may include:

- Identification of potential social and economic impacts*
- Sustainability assessments*

The assessment may also be required only for a specific part of the project (not the entire project) or may have to integrate with a larger program. It is important to specify this.]

3. Assessment Methodology

[This section should briefly describe a methodology/steps used in review.

For example:

- *Literature Review and data collection*
- *Community and stakeholder consultation (with particular focus on women and marginalized or vulnerable groups), and discussion with the relevant Government authorities*
- *Site inspections and data collection*
- *Preliminary engineering assessment of the restoration needs and alternatives*
- *Identify the potential impacts on the environment, and propose mitigation measures*
- *Assessment of the potential social impacts]*

4. Description of the project

4.1. Description of the site / location

[Including a map of the project site is recommended, as well as pictures of the site, in particular if it is infrastructure rehabilitation.]

4.2. Description of the works

[A brief description of the project and planned activities should be included. These can be presented in bullet point form. Particular attention should be given to aspects which may affect the environment, for example:

- Is there a need for heavy machinery? What type of material is required? Is demolition required?*

- What exactly needs to be built? What are the approximate dimensions of the construction (i.e. a 20 km road, a 500 m x 650 m hospital etc?)
- How large will the workforce be? What is the source of labour? (e.g. locally sourced)
- Would there be any residual aspects and impacts – increase in the natural resources demand?
- Would there be supporting facilities/structures required such as access road or utilities supply?]

5. Legislation and other requirements

Identify relevant legislation and regulations of the country where project is undertaken. Consultation with local authorities will be required.

*This section **MUST** be completed, as it is requirement of the UNOPS Environmental Management System.*

6. Description of the environment

Most of the data included here will be obtained through a combination of: i) literature review (available documentation), ii) field visits, iii) community consultation (possibly). This section will establish a baseline for the assessment of the potential environmental impacts.

Data collection requires planning – additional guidance is available in the UNOPS guidelines on the Environmental Review Process.

For all of these sections: please include photographs! Photographs will be the best tool to illustrate the context.

NOTE: Please include only useful and relevant information.

6.1. Description of the physical environment

The physical environment includes the soil, water, air, topography and precipitation.

This section may include the following aspects:

- Geology and ground water resources
- Soil type & composition, soil quality, prominent mineral deposits worth mentioning;
- Topographical and geographical features, gradient of the project site;
- Hydrology and river systems, how the rivers run, where they lie relative to the project site, aquifers and water tables, water quality
- Precipitation and annual rainfall, description of the rainy season (when is it? Is rain expected during the project implementation? How much?);
- Type of climate

6.2. Description of the biological environment

The biological environment includes fauna, flora, ecosystems and natural systems – both land and water based.

This section may include the following sections:

- Type of biomes or natural system: e.g. sandy desert, tropical forest, swamp, semi-arid land, etc.

- *Any protected or sensitive areas or reserves in the area of the project or its vicinity*
- *Biodiversity: indicate whether it is a biodiversity hotspot, an area with high biodiversity, or an area with low vegetation cover for instance*
- *Prominent ecosystems: identify the main type of ecosystem and highlight it if it is of particular importance (e.g. tropical forests and mangroves are ecosystems which require particular attention)*
- *Prominent species of flora and fauna: indicate relevant factors such as: main species present, high density species, endangered or protected species*

6.3. Description of the socio-economic environment

This section may include the following:

- *Populated areas and population density in the project area*
- *Current land-use, including land ownership by indigenous communities, and any planned developments*
- *Air quality and sound levels*
- *Main livelihoods in the area of the project, including resource use by local and indigenous communities*
- *Available socio-economic indicators and main issues*
- *Infrastructure services and transportation availability*
- *Main sources of conflict (if any)*
- *Cultural resources and sites of natural or cultural value*
- *Potential for discriminatory impact on particular groups: women, persons with disabilities, particular racial, ethnic or religious groups, etc.*
- *Opportunities for positive impacts on local communities or particular groups, like those listed above.*
- *Potential health, safety and/or security issues for local communities: e.g. spread of disease or increased crime*

7. Potential impacts of the project

The environmental aspects (meaning, how the project activities interact with the environment) and potential impacts should be identified for the project. Both negative and positive impacts should be identified.

Positive impacts alter the natural environment (physical, biological and/or socio-economic) to the benefit of the environment.

Negative impacts alter the natural state of the environment (physical, biological and/or socio-economic) to the detriment of the environment. These impacts should be mitigated to reduce the detrimental effect on the environment.

There are two kind of negative impacts - direct and indirect.

The direct negative impacts result directly from any project activity. For example:

- *Degradation of water quality due to waste produced by the construction works or to spills from machinery*
- *Depletion of natural resources (water, wood), used as construction material or for construction purposes*

These impacts will require mitigation measures to be identified and implemented.

The indirect negative impacts may occur after completion of the construction works, once the object of the project is operational. For example:

- *Land degradation, due to increase use of land for economic activities – resulting from the opening of a road*
- *Increased logging due improved access to the forest*

If some of these impacts can be mitigated during design stage of the project i.e. implementation of the green design principle, the review should identify such solution.

*Once the impacts are identified, their significance needs to be assessed. For negative impacts that have been assessed with 'High' and 'Medium' significance, a mitigation measures **MUST** be put in place to address them throughout the project cycle. Some of the impacts can be mitigated during the design stage, others during the implementation/construction phase.*

8. Analysis of the alternatives

Describe the possible alternatives to the project. This will generally include:

- *'no action' alternative*
- *Alternative(s) with variations for instance in site location, materials to be used, project products, product design, etc. – these should be aimed at reducing the environmental impacts identified*
- *The preferred alternative and justification for this option (generally this is the original planned works and activities – however it is necessary to justify the choice).*

9. Project Environmental Management Plan

The Project Environmental Management Plan describes how the potential environmental impacts will be addressed throughout the project cycle. This plan may, in agreement with the donor, result in the PEMP table to be included in the project document. However at this stage the Environmental Management Plan will cover the design and implementation of the project, and will include both mitigation measures and recommendations.

The mitigation measures should be realistic and within the scope of the project as these will have to be implemented during the project execution.

For those impacts that fall largely beyond the scope of the proposed project and works, incorporation of the recommendations is suggested. These recommendations are generally made to the government and development partners, to address indirect impacts which may result from the project.

Project Environmental Management Plan

Issues to consider	ASPECT description	Potential IMPACT (under normal, abnormal or emergency situations, as required)	Significance Rating	Action required / MITIGATION	Responsible party
<i>The list of impact types is not exhaustive and will vary between projects (see additional guidance on page 2 of this programme)</i>	How do the project activities interact with the environment in terms of the issues in the left hand column? <i>E.g. Debris from bridge repairs falls into river; or New road reduces congestion in town centre</i>	What change (impact) would this aspect of the activity have on the environment? Impacts may be positive(+) or negative(-) <i>E.g. Debris pollutes river; or Improved air quality, reduced noise</i>	Low, Medium or High – see the Notes below <i>E.g. High</i>	Identify whether the impact can be controlled or influenced by UNOPS and if so, what action is required <i>E.g. Erect shuttering to prevent debris falling into river, or incorporate green design, or to be managed by contractor on site</i>	Who is responsible, eg: <i>A named person within UNOPS or Contractor</i>
Community and stakeholder issues (i.e. planning requirements)					
Landscape & visual impact					
Ecology (habitats, flora and fauna)					
Archaeology and cultural heritage					
Air quality (emissions and indoor air quality)					
Water (usage, discharges and risk of floods)					
Contamination					
Energy (usage, source, cost etc)					
Processes (production, chemical, mechanical, etc)					
Materials (quantity and type used)					
Waste management					

Nuisance (noise, odour, dust vibration etc.)					
Transport (transport / traffic plans)					
Emergency Plan (Is a project one required?) Who would be the principal agency?					
Social					
Economic					
Other					

Significance rating:

Negative High	- High environmental risk - Client or legal requirement - Certain or frequent likelihood of occurrence	Negative Medium	- Medium environmental risk - NOT a client or legal requirement - Probable or occasional likelihood of occurrence	Negative Low	- Low environmental risk - NOT a client or legal requirement - Remote or improbable likelihood of occurrence	Positive	- Environment al opportunity
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To assist with the identification of the aspects and impacts for the project following guidelines can be used:

Community and stakeholder issues

- Consider any effects that the project may have on the stakeholders involved, including the local community, land owners, local societies in the project area. These may range from short-term effects such as noise and other inconveniences created by the project or long-term effects such as increase in the traffic in area.
- Is a community consultation exercise required?
- How might stakeholder views be integrated into the project or design?
- How close is the neighbourhood community to the construction site? What impact construction and operation of the facility will have on it?
- What is the impact of the construction of the site camp i.e water supply, sanitation, waste disposal?

Landscape & visual impact

- Consider whether a potential direct or indirect impact of the project will be the obstruction of existing views or the destruction of a natural landscape area.
- Consider the extent and consequences of the impact from the point of view of the stakeholders and the potential repercussions that this will have on the project itself.
- Are there any conservation areas or locally designated landscape areas that may be affected by the project?
- How can the project be modified to reduce the impact on the character of the landscape/townscape?
- Is site sloped? What are the risks of landslide? What is the impact of construction – i.e. erosion of slope, slope stabilisation required?

Ecology (habitats, flora and fauna)

- Take into account flora and fauna that may be affected and in particular, any protected species.
- Consider the full ecological impacts of the project activities. E.g. draining a wetland will potentially affect several species of plants, animals and insects indirectly but this may not be immediately evident.
- Consider also the sensitivity of the affected environment. For instance damage to an ecologically important site regardless of its size will have significant consequences e.g. nesting and breeding habitats.
- Does the site have any ecological designations? Is consultation with local or national body required? Are specialists survey required?
- If new plantings are proposed will these be indigenous?

Archaeology and cultural heritage

- Will be archaeological, cultural, historical importance places affected by the project? It is important to prevent not only direct and immediate impacts on these sites, but also to ensure that the project does not contribute in any way to the diminishment of the prominence of sites of archaeological and/or cultural heritage.
- Indirect impacts (lea chanaina aroundwater conditions) should also be considered.

- *Are desk studies or surveys required?*

Air quality (emissions and indoor air quality)

- *A project may have detrimental effects on air quality through emissions and dust particles generated during the construction period or through the operation of a completed facility e.g. a project to build a road.*
- *Consider the impacts of emissions from site vehicles, earthworks, stockpiles, traffic generated by the development and its operations.*
- *How could design, construction and operation be changed to mitigate air quality impact?*

Water (usage, discharges to surface water, groundwater and sewers)

- *Consider water usage in terms of quantity as well as quality. For instance it may not be necessary to use drinking quality water for all operations at a site and there may be a potential for savings here.*
- *Will consumption of the water by the project impact on the water delivery to the neighbourhood.*
- *Is more water being used than is necessary on the project? Consider whether upon completion the project will ensure that water is efficiently used and appropriately discharged.*
- *Will construction involve working in or over water or affect any surface water or groundwater in any way? What consents are required?*
- *Can surface water runoff cause erosion? If yes, how it will be controlled?*
- *Can project cause siltation of the streams and drains? For example compaction of the soil and grading of the site may alter drainage patterns and water tables, changing access to water by animals, people and vegetation.*
- *Are there any water bodies in the vicinity of the construction site that can be affected?*
- *Is site located in vulnerable area such as wetland, slopes, area prone to flooding, landslides, heavy rain fall, earthquakes? Are there flood protection measures incorporated in design?*
- *Are sanitary facilities available or would they have to be constructed? Where sewage can be discharged? Would treatment be required?*

Contamination

- *Contamination may occur as a consequence of materials used during the life of a project. The potential for contamination should be considered on any site but in particular on a site where past development has occurred. Contamination may not be an immediate effect, but may result after years of degradation of structures and components. Examples include lead used in paints and the use of asbestos in buildings, which become exposed with gradual degradation.*
- *Are there any risks of disturbing or excavating contaminated land?*
- *Contamination may also result from accidental spillage of chemicals and other hazardous materials (solvents, paints, vehicle maintenance fluids (oil, coolant), diesel fuel) used and stored on a construction site. If washed into the ground or stream, may contaminate water and create hazard to people and ecosystems.*
- *Can project cause pollution of the ground and water?*

Energy (usage, source, cost etc)

- *Energy use has direct environmental impacts in terms of fuel consumption and emissions and can be a considerable construction or operational cost. Excessive energy usage should be avoided if possible and energy saving measures (low energy light bulbs; timed lighting; natural lighting; natural heating and district heating systems) may result in substantial cost savings. Consider the efficiency of the energy usage and the source of the energy both during the project life and after it is completed. Is energy being wasted?*
- *Will the end result of the project be as energy efficient as possible?*
- *Are renewable energy sources being used where possible?*
- *During operation what inputs are needed, including raw materials, water, or energy sources? Where will they come from?*

Processes (production, chemical, mechanical, electrical)

- *Civil engineering schemes, particularly those in the water industry, may involve complex and resource consuming processes, i.e. sheet piling can cause unpleasant and undesirable vibration. Will your project involve these processes and if so can alternative processes be used that have less impact?*

Materials (quantity and type used)

- *Consider the quality and quantity of materials and their source. Some materials can be more environmentally friendly than others based upon their embodied energy, ability to bio-degrade, waste products or their direct impact on the environment in which they are used. Embodied energy is high in products like steel and cement because they require a large amount of energy in production.*
- *Where are the construction materials coming from - are they local or from a distant source? Products imported from overseas require energy for transportation. Local sourcing of goods and materials can help to support local businesses and communities.*
- *Is the material from a sustainable source? Can reused, recycled or renewable materials be used in place of virgin or non-renewable materials? Do new materials being used have the potential to be recycled? Does the material have high durability and a long life span so will not need substantial maintenance or need replaced as often?*
- *Does the design optimise the efficiency of materials use to reduce consumption and/or generation of waste in construction?*
- *Is quarrying required? Are borrow pits for earth fill needed? Where is wood coming from?*

Waste management

- *Will the project result in the production of waste?*
- *What are the opportunities to design out waste? There should be a waste management system in place to ensure that waste is reduced, recycled or re-used as far as possible and that waste is sorted for disposal by appropriate categories (e.g. wood, metal, green waste, hazardous waste).*
- *Hazardous wastes such as asbestos require special handling, permits etc.*
- *Consider the quantities of waste produced and the quality of the waste in terms of its potential for contamination.*
- *Look for opportunities for reuse: for example earth or construction rubble - noise or flood defence bunds or road sub-base can usually be made with low quality, locally sourced*

materials that cannot be used for other construction purposes and might otherwise be placed in landfill.

- *If earth or vegetation is removed, what will be done with it?*

Nuisance (noise, odour, dust vibration etc.)

- *Nuisance is often perceived to be a problem during the construction period of a project. However, the end result of a project may also cause nuisance through its ultimate function. Nuisance can be noise, vibration, odour, dust, site appearance, tidiness, lighting etc but can also include the behaviour of site staff towards the general public or local residents.*
- *Are surveys required to establish baseline conditions and predict potential nuisance impacts? Are permissions required to manage those impacts before construction or operation commences?*

Transport

- *Consider whether the project will increase or decrease transport demand.*
- *What type of transport will be used during construction and operation?*
- *Is a transport assessment required? Will the traffic management plan be required during construction?*
- *Is construction of the haul road required – what impacts that will have?*

Suppliers and subcontractors

- *In order to ensure that all activities are carried out in a safe, ethical and environmentally responsible way, it is important to ensure that suppliers and subcontractors are governed by the same principles that govern our working methods (e.g. safety, quality and environmental management systems). In addition it must also be established that they are capable of the tasks to which they are assigned. Possible problems may result due to a lack of sufficient information on suppliers and subcontractors. It is pointless to operate an EMS and then use suppliers/subcontractors that do not adhere to similar principles. This is a risk to UNOPS reputation and project performance.*

Emergency plan

- *Certain activities may require planning for emergency situations to ensure that serious environmental damage or harm to environment, for instance, emergency containment procedures for spills of hazardous materials (fossil fuels, coolants, chemicals etc.). Consider whether any activity is likely require such procedures and if any are in place consider whether or not they are adequate*

Social

- *Consider what will be the social impact of the project, both during construction and operation?*
- *Where is labour coming from? Is there a risk that construction schedule will compete with local crop harvesting?*
- *Will project require/result in relocation of local communities?*
- *Can project result in contributing to spreading disease – for example standing water in borrow pits may be source of disease-bearing insects.*
- *Is there potential for increased crime or violence? (e.g. by influx of workers)*

- *How distant is the site/facility from the intended users – is construction of the access road required? What are the impacts of such construction?*
- *Who are the intended beneficiaries of the project? Are there issues of discrimination with regard to accessibility to project products or services?*
- *Are there on-going conflicts in the area?*
- *Will the project have consequences for land ownership by local/indigenous communities? Will the project affect access to resources used by local/indigenous communities to support livelihoods?*

10. Conclusions

Briefly summarize the main findings of the assessment.

References

Include all references cited and documentation used for the purpose of this assessment

Annexes

For example:

- *Relevant documents like minutes of meetings with local government authorities, transcripts of community consultations and perhaps recommendations of other NGO's or UN*

Generic Register of Environmental Impacts

Table below provides a summary of the standard environmental aspects, impacts and mitigation measures for a typical construction project. This is a tool to assist the project manager in completion of the site specific Register of Environmental Impacts. It must be noted that the impact and mitigations outlined in this document should be review for applicability and suitability for implementation on the project. Only mitigations/controls that can be realistically implemented on site should be included in the site specific Register of Environmental Impacts.

The list is not exhaustive. Specific aspects, impacts and mitigation measures may also be identified during the Environmental Review/Environmental Impact Assessment or design review. The applicable aspects should be also included in the Site Specific Register of Environmental Impacts.

Category	Aspect	Impact	Mitigation/Control Measures
Water	Excavation, water runoff during excavation carrying sediment	<ul style="list-style-type: none"> • Siltation of local waterways • Flooding neighbouring properties and roads and damage to them • Damage to marine life • Blocked storm water systems 	<ul style="list-style-type: none"> • Minimised exposed soil areas • Cover over bare soil with mulch, grass, planting or materials such as geotextile • Excavation stock piles to be located away from water runoff, channels or kerbs. Stockpiles to be covered. • Excavated material stockpiles to be bunded – use sand bags • Divert upstream runoff away from the site • During construction diverting roof and other structures run off via temp pipe work • Use of sedimentation tanks • No pumping from bottom of sediment tank or directly from tank into kerb or catch pit • Filter cloth used as a temporary emergency basis • Never hose down concrete/material spillage into natural or storm water systems. • Locate wheel wash or truck wash areas away from the natural and storm water drain systems
Water	Water contaminated by concreting	<ul style="list-style-type: none"> • Pollution of natural waterways - harm to aquatic life 	<ul style="list-style-type: none"> • Never hose down concrete/material spillage into natural or storm water systems. • Where possible plan to pump/ deliver concrete away from drains and natural waterways.

	works, demolition, and cleaning of structures	<ul style="list-style-type: none"> • Pollution of the natural waterways via surface water drain 	<ul style="list-style-type: none"> • Sweep or shovel spills and allow residue to set before moving • Use of spill mats and sandbagging in drains • Use of sand bags, baffles, settlement tanks to encourage settlement of fine particles • Use filter cloth to filter water at the outlets • Implement regular monitoring of the watercourse incl. water quality testing
Water	Rainfall creating mud	<ul style="list-style-type: none"> • Pollution of the roads – mud spread by the construction vehicle movement • Nuisance to the neighbourhood • Potential H&S hazard contributing to accidents caused by trips, slips and falls 	<ul style="list-style-type: none"> • Truck tyres to be washed before leaving site – establish designated wheel wash (bundled and drained) • Use road sweeper to clean roads • Limit the excavation activities during the rainy season • Establish designated areas for truck wash downs • Use high pressure and low volume equipment if possible
Water	Washing of the concrete or oil/fuel during trucks washing	<ul style="list-style-type: none"> • Potential contamination of the water and ground from the concreting/concrete truck washing • Potential contamination to ground and water with the oil/fuel from washing of the vehicles 	<ul style="list-style-type: none"> • Set the concrete truck wash out, ensure that it is set in the bundled, impermeable surface • Use settlement tanks • Use oil separator for the settlement tanks
Water	Waste water from site facilities (sewerage) and from site cleaning activities e.g. painting and plastering	<ul style="list-style-type: none"> • Waste water/washed toxic solvents, heavy metals entering natural and storm water systems causing pollution and potential harm to aquatic life and H&S hazard for human and livestock 	<ul style="list-style-type: none"> • Waste water from site facilities will be connected to local authority sewer system • Waste water from site facilities stored and removed from site to approved sewerage/waste water collector • Establish cleaning stations for small tool use. Sinks with water piped into storage tanks. Tanks sized to meet site requirements. • Provide spill kits in the area of the painting/plastering • Establish regular checking regime of the condition of the sewer connection/sewage storage facilities • Implement regular monitoring of the watercourse incl. water quality testing
Water	Discharge of the site drainage to	<ul style="list-style-type: none"> • Risk of causing flood downstream of the discharge from site 	<ul style="list-style-type: none"> • Estimate volume of the discharge from site • Review condition/capacity of the drain/watercourse • Agree discharge volume with local authority

	the watercourse or local drainage		<ul style="list-style-type: none"> • 2 or more discharge points • storage on site • monitoring of the discharge form site
Water	Damaging existing live sewerage lines	<ul style="list-style-type: none"> • Spillage of the waste to site, potential pollution, harm to aquatic life and H&S hazard for human and livestock • Risk of flooding 	<ul style="list-style-type: none"> • Locate all existing services lines before excavation, mark out and hand dig if required • Use permit to dig
Water	Damaging existing live water lines	<ul style="list-style-type: none"> • Risk of washing out the material stored on site • Disruptions in the water supply to people and livestock • Risk of flooding 	<ul style="list-style-type: none"> • Locate all existing services lines before excavation, mark out and hand dig if required • Use permit to dig
Water	Steel/Roof works with steel off cuts and swarf Material cutting of brick, tiles, block cutting	<ul style="list-style-type: none"> • Storm or natural water systems contaminated with metals • Swarf in the natural water systems - pollution, potential hazard to human and livestock • Toxic water and dust runoff with heavy metals, petroleum products and alkalinity – pollution, potential hazard to human and livestock 	<ul style="list-style-type: none"> • Set up cutting equipment away from drains and natural waterways • Use wet cutting if possible and control water run off • All hazardous dust omitting machines should be fitted with dust suppression kits • Enclose areas of the cutting to capture residue cutting • Collect residue cutting /material waste and dispose appropriately • Prevent debris from falling into watercourse
Waste	Waste generated by site activities General site housekeeping and waste storage/removal	<ul style="list-style-type: none"> • Potential pollution to the ground and water • Increase landfill deposits • Increase in transportation needs – contribution to pollution and increase of the carbon footprint • Potential attraction to vermin – sanitary issues 	<ul style="list-style-type: none"> • Prepare site specific waste management plan • Care planning (i.e. purchase planning) and sequencing to reduce excess waste on the project • Review disposal options prior commencement of the work • Segregate materials as they are generated • Segregate hazardous from non-hazardous waste • Remove organic waste at regular intervals • Provide bins and skips for site • Identify reclaim and reuse materials where possible – implement recycling scheme

			<ul style="list-style-type: none"> • Dispose materials in accordance with the waste management plan/agreement with the local authority • Use licensed waste carriers • Do not landfill liquid hazardous waste • Use covered/secured bins to minimize risk of vermin and pollution from the rain fall
Spillages	<p>Leakages of chemicals, oil, fuels and fluids from storage tanks and containers</p> <p>Uncontrolled disposal of above and spillage during application of chemical treatments and finishes.</p>	<ul style="list-style-type: none"> • Contamination of the water and ground • Damage to vegetation and wildlife through contamination of water supply, watercourses, ground and possible food chain 	<ul style="list-style-type: none"> • Fuel, oil, chemicals of fluids stored in the designated hard standing areas, with bunding, spill trays • Use double skinned tanks/containers • Spill kits available on site – located in the areas with the high risk of spillage like re-fuelling area, oil storage area • Suitable training provided to site operatives • Ensure material data sheets are read and understood with correct handling methods used and emergency procedures ready to be carried out • Implement proper maintenance of the storage containers • Implement regular checks and monitoring of the condition of the storage areas incl. storage containers
Spillages	Uncontrolled disposal/spillage during refuelling	<ul style="list-style-type: none"> • Contamination of the water and ground • Damage to vegetation and wildlife through contamination of water supply, watercourses, ground and possible food chain 	<ul style="list-style-type: none"> • Refuelling to take place at a designated location – hard standing area • No refuelling of vehicles/plant and equipment near to storm water, natural water ways and marine environments • Trained operators and emergency stop devices used in all refuelling exercises • Spill kits available in the refuelling location
Spillages	Leakages of chemicals, oil, fuels and fluids from equipment	<ul style="list-style-type: none"> • Contamination of the water and ground • Damage to vegetation and wildlife through contamination of water supply, watercourses, ground and possible food chain 	<ul style="list-style-type: none"> • Use electric equipment if practicable • Use drip trays underneath the equipment • Implement regular monitoring and inspection of the condition of the equipment, • Remove faulty, oil/fuel leaking equipment from site • Spill kits available on site

			<ul style="list-style-type: none"> • Undertake maintenance of the equipment in the designated, hard standing location – ideally away from the watercourse and drainage • Protect the drains
Contamination	Contaminated land discovered during excavation	<ul style="list-style-type: none"> • Danger from buried material e.g. asbestos, biological, explosives etc • If present contaminated material is disturbed by the construction activities, may cause pollution to the ground and water 	<ul style="list-style-type: none"> • Investigate site history prior to commencing works ⁽¹⁾ • Undertake the testing of the soil if the contaminated land is suspected ⁽¹⁾ • Stop work immediately, plan site cleanup and disposal
Dust	<p>Dust created by excavation, filling and piling activities</p> <p>Dust created by demolition activities</p> <p>Dust created by the general construction activities incl. traffic</p>	<ul style="list-style-type: none"> • Nuisance to workers, neighbours and general public • Health risk to operatives • Loss of visual amenity • Potential damage to adjacent properties 	<ul style="list-style-type: none"> • Use water sprinklers on the site roads to reduce dust • Workers/operatives to use appropriate PPE • Use fine mist water spray on demolition • Minimize drop heights for loading and unloading operations • Introduce hard surfacing or paving of haul routes • Introduce external perimeter fencing/scaffold screening to contain dust • Cover loads during transport • Limit soil stockpile heights and slopes, protect from wind, cover if necessary • Re-vegetate cleared areas • Sequence of demolition works to minimise dust (internal first, then external structure/frame) • Consider speed limit on site
Dust	<p>Processing of materials, by sanding, cutting and the alike</p> <p>Dust created by cutting, blasting,</p>	<ul style="list-style-type: none"> • Nuisance to workers • Nuisance to adjacent neighbours and general public • Health risk to operatives • Damage to finished surfaces 	<ul style="list-style-type: none"> • Deliver pre-cut material where possible • Protect existing finished works • Use wet cutting/blasting/drilling where possible • Workers/operatives to use appropriate PPE • Consider enclosing the working area • Consider extraction for the enclosed working area

	drilling of concrete		
Noise	<p>Earthworks, use of heavy machinery</p> <p>Breaking out, grinding, coring of concrete work</p> <p>Concrete pump pouring</p> <p>General site plant, tools and equipment use</p>	<ul style="list-style-type: none"> Hearing damage to workers on site Disturbance to adjacent neighbours and general public Potential disturbance to the wild life and livestock 	<ul style="list-style-type: none"> Appropriate selection of plant and equipment (consider plants with the acoustic enclosures) Maintenance and regular checking of the equipment condition Use mufflers on equipment and plant Liaison with neighbours if required to confirm appropriate time for noisy activity - Limit work within the night/sensitive hours Operatives to use appropriate PPE Introduce acoustic screening Consider enclosing plants in the acoustic box Identify noise levels prior to commencement Locate park plant away from site boundaries If possible, locate the areas of noisy activities away from the sensitive receiver i.e. houses/livestock Turn off plant when not in use Regular monitoring of the 'noisy' activities and recording of noise levels For vehicles consider speed limit on site
Noise and vibration	<p>Piling activity</p> <p>Vibration through soil during construction works</p>	<ul style="list-style-type: none"> Disturbance to adjacent property, neighbours and the public Hearing damage to workers on site 	<ul style="list-style-type: none"> Operatives to use appropriate PPE Bored piles instead of driven Hydraulic rig to be used if available Appropriate selection for plant and equipment Keep machines well maintained Use smallest machine that will achieve the operation/job/task
Archaeology ⁽²⁾	Presence of artefacts,	<ul style="list-style-type: none"> Damage to items of historic importance during the construction activities (excavation, earthworks) 	<ul style="list-style-type: none"> Isolate the area identified as location of the archaeology presence Use trial pits before commencing substantial excavation Use permit to dig system

	cultural remains, bones, etc		<ul style="list-style-type: none"> • Use hand digging • In case of discovering any items – stop work immediately, inform supervisors (UNOPS), isolate the area • Consult with the local authorities and experts as necessary
Ecology – wild life (flora and fauna) ⁽³⁾	Excavation works or other construction activities [define applicable]	<ul style="list-style-type: none"> • Possible damage or growth reduction of plants and trees • Possible disturbance to the wildlife habitat due to general construction activities 	<ul style="list-style-type: none"> • Identify any wild species on site – liaise with the wild life organisations, inform the Client • Identify the likelihood of the presence of livestock • Identify the breeding and nesting season and avoid work during that period • Provide screening (barriers/fencing) between the working area and area where the susceptible wild life has been identified • Minimise disturbing activities in the areas where susceptible species have been identified • Location of the invasive construction activities (i.e. hot work) or facilities (wash down facilities) away from sensitive areas (habitats, plants)
Ecology – wild life (flora and fauna)	Construction vehicles movement	<ul style="list-style-type: none"> • Possible disturbance to the wild life habitat due to excessive vehicle movement 	<ul style="list-style-type: none"> • Provide screening (barriers/fencing) between the construction area and area where the susceptible wild life has been identified • Minimise traffic movement in vicinity of the area where the wild life has been identified
Air	Fumes discharged from transportation and site vehicles	<ul style="list-style-type: none"> • Disturbance to adjacent properties, neighbours and public • Health and ecological risks from inhalation of fumes containing gasses 	<ul style="list-style-type: none"> • Introduce regular maintenance and service for vehicles • Use of electric plant • Use plants and equipment with the catalytic converters • Minimise traffic requirements by rationalising the traffic routes • Establish traffic management plan • Turn the engines off when plant not in operation • Remove plant with the excessive fumes from site

Air	Emissions of fumes, toxins and adhesives released into the air during painting, coating	<ul style="list-style-type: none"> • Pollution of air • Creation of fire hazard • Health risk to the operatives • Nuisance to neighbours and the public 	<ul style="list-style-type: none"> • No incineration of any waste materials allowed on site • All enclosed spaces to be well ventilated • Painting and liquid application activities undertaken in calm conditions • Provide adequate ventilation • Consider using of non-solvent (water) based paints
Air	Emission of fumes created by the work activities (hot work, waste burning)	<ul style="list-style-type: none"> • Risk to the human health – operatives and neighbourhood • Setting fire to landscape – loss of biodiversity • Smoke hazard – air pollution 	<ul style="list-style-type: none"> • Consider substitution for hot work activities • Use screening and fencing • No incineration of any waste materials allowed on site • Hot work permit system to be used • Fire fighting equipment available
Air	Odour from the organic waste, toilets	<ul style="list-style-type: none"> • Nuisance to the neighbourhood • Potential for the sanitary hazard 	<ul style="list-style-type: none"> • Implement the suitable waste management system • Ensure that organic waste are suitably stored • Ensure regular disposal of the waste
Air	Damaging existing live gas lines	<ul style="list-style-type: none"> • Pollution to the air, risk of explosion and fire 	<ul style="list-style-type: none"> • Locate all existing services lines before excavation, mark out and hand dig if required • Use permit to dig
General	Raw material depletion	<ul style="list-style-type: none"> • Resource intensive materials • Depletion of materials • Manufacturing environmental impact 	<ul style="list-style-type: none"> • Review and consider alternative products and materials where possible taking into consideration production techniques, raw material components and transportation emissions. • Carryout full life cycle analysis when comparing different materials and building systems • Use recycled aggregates, timber and steel where available and cost comparable • Minimise the use of materials with high VOC emissions, PVC and other undesirable building products

General	Site office operation (electricity, heating, air conditioning, waste, paper), workers transportation	<ul style="list-style-type: none"> • Contribution to increase of carbon footprint • Potential pollution from exhaust • Energy intensive processes, burning of fossil fuels, use of electricity on site, transportation and waste disposal 	<ul style="list-style-type: none"> • Source materials locally where possible • Use renewable building materials and products wherever possible • Purchase in bulks (quantity of material) to minimise transport needs, but to avoid unnecessary buys • Specific waste management plans with bins allocated for recycling • Use recycled/scrap paper for notes • Turn off equipment, tools, machinery, power, etc when not required or in use • Turn off heating (air-con) and light in rooms that are not in use • Use of public transport • Employ local labour • Use bus-crew transport
General	Unauthorised entry/wilful damage to site by trespassers	<ul style="list-style-type: none"> • Safety of intruder • Tampering with equipment/safety devices - damage to property • Spillage of hazardous materials - pollution • Fire 	<ul style="list-style-type: none"> • Site to be fenced and secured - alarm systems, live security guards • Lock chemicals, petrol, hazardous materials and substances storage
Landscape and visual impact	Loss of natural light due to construction	<ul style="list-style-type: none"> • Disturbance to tenants, neighbours and general public 	<ul style="list-style-type: none"> • Site accommodation, temp hoardings and support structures to be located in a way that minimises disruption to neighbours • Undertake liaison with the community

Notes:

- 1) Risk/likelihood of the presence of contamination of the ground should have been assessed and identified during Environmental Review/Assessment.
- 2) Likelihood of the archaeology presence on site should have been assessed during the Environmental Review/Assessment. Liaison with the local authorities and relevant specialists may be required.

3) Ecology presence and impact of the construction activities on it should have been established during the Environmental Review/Assessment.

Office Waste Management Plan

Office name			
Office location			
(If relevant - other office locations within boundary)			
Officer responsible for environmental planning – waste management			
Plan valid from:		Plan valid until:	

HOW TO PREPARE AN OFFICE WASTE MANAGEMENT PLAN

- 1) Identify (tick) the **fractions of waste** that you plan to separate. If a fraction is not present, or is not separated in your office yet, you can indicate “not applicable”. All remaining unsorted waste falls under the “mixed remaining waste” category.
- 2) All **hazardous waste must be separated** and treated accordingly to UNOPS guidance GEM07 on hazardous waste management.
- 3) Include a short description of the **actions and initiatives** that are **planned to improve the waste management of one or more fractions**. The typical duration of these plans is one year.
- 4) Based on your plans, determine how much waste will be recycled, used for energy recovery or disposed of in landfill during the year ahead. Express **the targets in % for each disposal method**, and for each waste fraction. The objective is to progressively increase the % waste treated according to the waste hierarchy.
- 5) If available, consult the previous year waste report for your office; it will help set realistic targets.
- 6) After a 12 month cycle, compare **the target** for each waste fraction with **the actuals***; evaluate the effectiveness of your waste management programme and make the necessary adjustments for next year.

* The actual figures on waste generation and disposal should be aligned with those communicated for the yearly environmental inventory.

WASTE MANAGEMENT TABLE										
WASTE FRACTIONS		PLANNED ACTIVITIES AND NOTES (see waste hierarchy and UNOPS waste Guidance)	DISPOSAL METHODS							
			% reuse/recycle /compost		% energy recovery		% landfill or controlled disposal		% unknown	
			Target	Actual	Target	Actual	Target	Actual	Target	Actual
Non-Hazardous Waste										
Paper/cardboard										
Hard/soft plastic										
Organic (food, garden waste, etc.)										
Wood										
Glass										
Metal (cans, etc.)										
Fabric/textiles										
Mixed remaining waste**										
Other non-hazardous (please specify)										
Hazardous Waste										

E-waste (computer, phones, etc.)										
Batteries										
Light bulbs and lamps										
Paints and chemical products										
Motor oil and related fluids										
Tyres										
Other hazardous (please specify)										

**** This is the fraction of waste that your office cannot segregate. Depending on the maturity of your waste management programme, some of the materials listed before may end up in this remaining waste fraction.**

- 7) Optional: if the office plans to introduce **waste prevention initiatives**, include here details about the activities, the previous year baseline and related reduction targets, both in terms of absolute volume and volume per capita. At the end of the year, compare with the actual amounts of waste generated and evaluate the effectiveness of the waste prevention activities.

OPTIONAL - WASTE PREVENTION TABLE								
WASTE FRACTIONS		PLANNED REDUCTION ACTIVITIES (see waste hierarchy and UNOPS waste Guidance)	[previous year] quantity		Target quantity		Actual generated quantity	
			Absolute	Per capita	Absolute	Per capita	Absolute	Per capita
Hard/soft plastic								

Paper/cardboard								
Mixed remaining waste								
Other (please specify)								

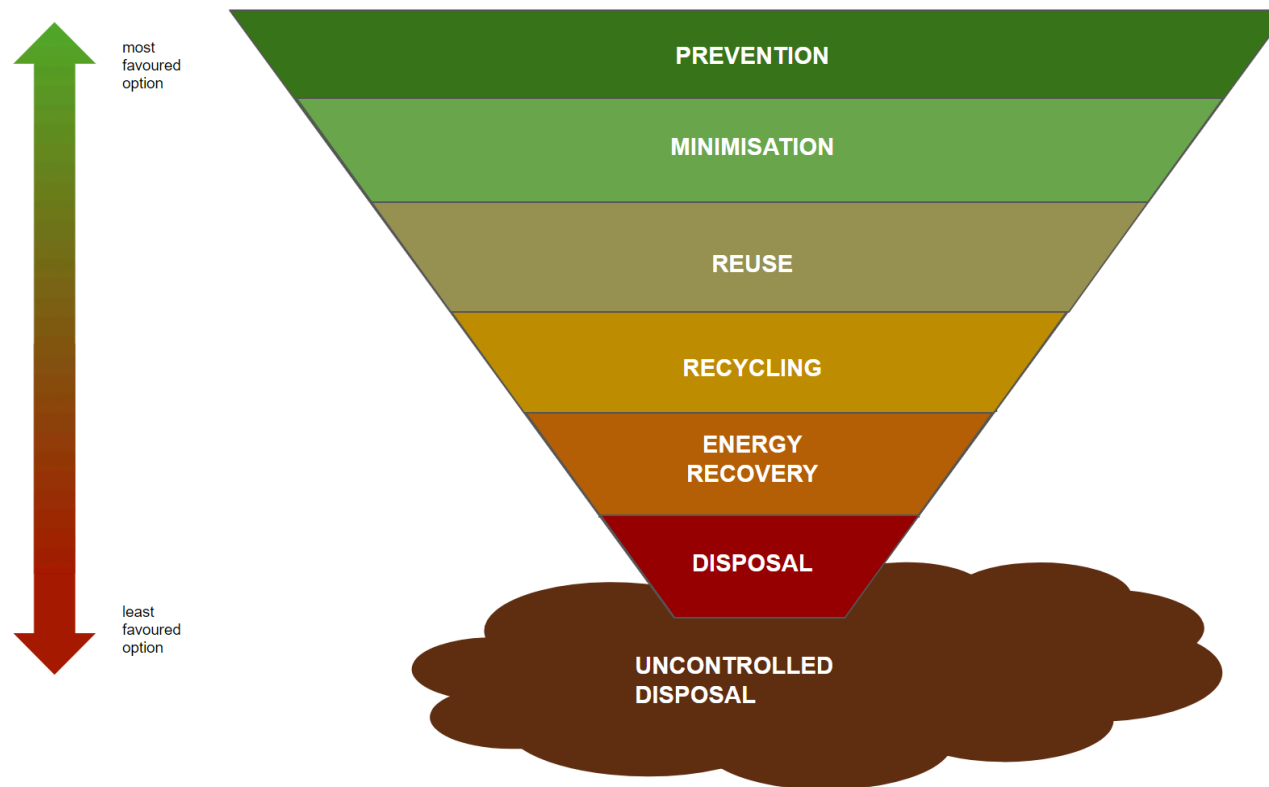
8) Provide additional information on capacity building, final destination and chain of custody for waste, etc.

	Additional items to consider in your Waste Management Programme:	Comments/Action
1.	Landfill/Disposal Site: Has the site been identified for all materials? Approved? Licensed? Acceptable to local authorities?	
2.	Are disposal facilities for hazardous material available and identified?	
3.	Will a waste removal contractor be appointed? If so, are they aware of the requirements of this plan?	
4.	Is any waste donated/reused outside the office? If so, do you know where?	
5.	Will there be an audit and or review process of the waste management plan? Provide details.	
6.	Have all personnel and workers been made aware of requirements of this plan for waste segregation and processing?	
7.	Are there any specific training needs that should be addressed to implement this plan?	
9.	Other initiatives, comments, issues.	

UNOPS GUIDANCE and MINIMUM REQUIREMENTS on WASTE MANAGEMENT:

- [GEM02 Waste Management](#)
- [GEM07 Hazardous Waste Management](#)

Figure 1 - The Waste Management Hierarchy:



Waste Management and Hazardous Substances

The word '**SHALL**' in upper caps and bolded indicates a **mandatory requirement**.

1. Emphasis on hazardous waste

Hazardous waste is waste that is likely to cause substantial harm to the environment or to human beings. For UNOPS infrastructure operations, examples include, used oil, spillages of fuels and oils, asbestos waste, concrete/cement washings and fluorescent light fittings (containing mercury residues). These substances must be separated from other wastes and disposed of carefully to avoid release into the environment. Releases could be through leachates seeping into soil and/or water bodies, or vapours escaping into the atmosphere. Hazardous waste may be handed over to the local authority in line with local procedures if local capacity to handle the waste exists. The guidance of the Health, Safety and Environment Manager, Sustainable Infrastructure Practice Group (SIPG) should be sought where there are no local facilities to handle the waste.

2. General

The main principles of effective management of waste are:

- efficient use of resources to eliminate or reduce the generation of waste,
- diversion of waste from landfill by reuse or recycling,
- disposal of remaining waste.

In majority cases waste management in construction is governed by legislation which can be summarised as ensuring that disposal of waste is regulated (and traceable) and that the cost of waste disposal is borne by the waste producer (in-line with the Polluter Pays Principle).

Generally waste can be subdivided into the following categories:

- organic waste
- inactive waste - materials that do not cause environmental pollution or harm to human health or endanger the quality of any surface water or groundwater when deposited in a landfill under normal conditions. These include rocks, ceramics, concrete, masonry, and brick rubble.
- non-hazardous waste - include timber and bitumen
- hazardous waste - waste that is deemed to be dangerous to life and/or damaging to the environment. It may be corrosive, reactive, explosive, oxidising, carcinogenic or flammable i.e. asbestos, acids, alkaline solutions, oily sludges, waste oils and wood preservative.

3. Planning stage

Waste management should start with resource efficiency by using the raw materials wisely. To manage waste effectively, focus should be directed on ways to prevent materials becoming waste:

- If possible, developing standardised sizes or pre-cut materials to reduce off cuts (i.e. timber)
- If possible, arranging for the return of unused construction materials to suppliers,
- Control of purchasing of the materials – do not purchase unnecessary items, that would have to be disposed later on,
- Specifying/negotiating reduction in the amount of packaging used by suppliers, or packaging return schemes,
- Specifying pre-cast units (i.e. concrete panels rather than on-site pours),
- Employing selective demolition - dismantling, often for recovery, selected parts of buildings to be demolished before the wrecking process is initiated,
- Storing materials delivered to site carefully to minimise potential damage and creation of waste (off-ground storage, maintain original packaging, covered protection from the weather and protection from collision by plant and vehicles).

Measures to minimize volume of waste generated **SHALL** be recorded in the Project Environmental Management Plan.

The planning stage can also consider opportunities for reuse and recycling waste generated on site.

4. Waste Reuse/Recycle

As much as possible construction and demolition debris should be prevented from disposal into the landfills. This can be achieved by reuse and recycle materials on site. Following examples present how materials can be re-used on the project:

- excavated stone can be used to build retaining wall in place of the gabions; this allows for cost saving on installation of gabions and disposal of the stone,
- concrete from demolition of existing structures can be crushed and then used as general fill material – i.e. concrete can be used on haul roads and when these are removed, it can be used as a capping layer for the new footpaths.
- trees removed as part of construction can be shredded and reused as mulch, which is used for landscaping and promoting the growth of new habitats
- excavated material can be reused for backfilling, this eliminates the need to import other material onto site saving time and money.
- Excavated material (gravel, stone, sand) or other suitable construction waste (brick, concrete) can be used as cover material at the landfill, backfill at new construction sites, for the reclamation of wetlands, for the filling of low-lying areas subject to regular flooding or can be sold to other engineering contractors.
- Scrap metal - has a residual value and can be sold to the scrap metal dealers

The local waste market should be investigated - there may be potential for recovery and reuse of materials from the waste such as recycling of paper, metals, glass, and plastic.

5. Site Waste Management Plan

Each construction project **SHALL** prepare Waste Management Plan (**Form EM 02**). The Plan **SHALL**:

- identify each type of waste that is expected to be produced, including identifying wastes that are inactive, non-hazardous, hazardous and organic,
- estimate the quantities of waste that are expected to be generated,
- for each waste stream consider how the waste will be disposed – take into account availability of facilities in the area of the site,
- demonstrate how reductions in overall waste expected to be generated and the reductions in waste to be sent to landfill can be achieved,
- define facilities on site and outline an action plan: i.e. construction of waste storage area, liaison with local government, communication plans, training,
- identify person responsible for waste management on site.

The plan **SHALL** be regularly reviewed to evaluate performance against action plan including targets and records shall be updated.

The waste management should consider the most suitable (practical, financial, technical) solutions.

6. Storage of hazardous substances and wastes

Storage and handling of hazardous substances

Substances that may harm people or the environment shall be handled and stored in a way that prevents accidental release.

- Drip trays shall be placed under leaking under generators, vehicles and other equipment to prevent spills of hydrocarbons reaching the soil or watercourses.
- Storage tanks shall have secondary containment, so that leaking liquids may be collected in the event of a failure. Secondary containment should ideally have a capacity of at least 110% of the holding capacity of the tank it is protecting.
- To avoid leaks, proper funnels should be used when decanting to other containers. It is recommended to use a hand pump rather than a funnel and smaller containers for frequent/routine transfers from one container to another (or to a vehicle tank).

Waste storage areas **SHALL** be provided on site:

- Sufficient space should be allocated on site for the waste expected to be generated,
- Storage areas **SHALL** be indicated on site plans for communication purposes,
- Storage areas **SHALL** have clear signage to ensure different wastes are stored in the correct place,
- Storage area **SHALL** be enclosed to prevent waste escaping – i.e. spread of waste by wind-blown; if possible covered skips are suggested to be used,
- If possible waste should be protected from the rain fall/water ingress,
- Waste storage **SHALL** not be located in the area prone to flooding or on the slope,

- Location of the waste storage should be away (min 30 m) from human settlements, animal pastures, water bodies, water sources etc
- Hazardous wastes SHALL not be mixed with non-hazardous waste,
- Organic waste SHALL not be mixed and stored with non-organic waste,
- Hazardous wastes **SHALL** be stored in suitable containment, on impermeable surface

Practical advice:

Store waste in one place and segregate immediately. In such way you will avoid piles of waste scattered throughout the site, which is dangerous and double-handling waste.

7. Waste Segregation

As much as possible waste on site should be segregated - that will help recovery of reusable or recyclable materials:

- Make segregation easy to do by providing separate areas (containers) in a designated impermeable waste storage area
- Brief staff on the segregation requirements
- Organic waste SHALL be segregated from non-organic waste
- Hazardous waste SHALL be segregated from non-hazardous waste
- If there is no space on site to segregate wastes for reuse or recycling, consider off site recycling by using a waste management subcontractor that has the necessary facilities.

8. Waste Disposal

Disposal of waste from site must only be carried out by a registered waste carrier who should be able to provide a copy of their waste carriers' licence – check local government/authorities requirements. Waste materials removed from the construction area **SHALL** be disposed at the approved landfill site.

It is recommended to carry out review of the local waste practices - what waste facilities are available in the country/region. If no facilities are available nearby the site, this may be an opportunity for joint action with the local community to explore options to create local disposal site – controlled dump site.

Unauthorised and uncontrolled dumping of the waste generated on construction site is strictly forbidden.

9. Burial of waste

If there are no waste collection facilities in the area, disposal of construction waste should be by burying. Burial **SHALL** be in pits. Following conditions **SHALL** be followed for pits location and construction:

- located downstream of any water sources (30m away),
- away from human settlements (at least 50m distance),
- only inactive or non-hazardous waste, which do not have potential for leaking can be buried,

- bottom of the pit should be min 1.5m above water table,
- sides of the pit need to be stable and should be at 45 degrees unless a geotechnical expert advises otherwise,
- a small fence SHALL be constructed around the pit to avoid accidents and scavenging,
- pit SHALL be protected from the rain water ingress and from the wind (prevent spreading waste in the area),
- location of the pit SHALL be agreed with the UNOPS representative and local authorities, if necessary.
- pit SHALL be covered by at least 600mm of earth material prior to abandonment.

No hazardous waste (medical waste, batteries) should be disposed in these pits.

Wherever possible the organic waste should be composted.

10. Burning of waste

Burning of waste on site is the last option for disposal of waste, allowed only if all other options are exhausted. If this form of the waste disposal is necessary, it will require permission of the UNOPS HSE Manager.

Uncontrolled and unauthorised burning of the waste generated by the project is strictly forbidden.

Burning of the hazardous waste is strictly forbidden.

If burning of the waste is authorised by the UNOPS HSE Manager, it **SHALL** follow following rules:

- be undertaken in the pits, located downwind of the construction site and dwellings – as a minimum 50m away,
- treated wood should be removed from the waste stream before burning,
- fire prevention measures shall be implemented to reduce fire hazard.

Hazardous Waste Management

The word '**SHALL**' in upper caps and bolded indicates a **mandatory requirement**.

Mandatory requirements in this document are:

- Hazardous waste **SHALL** be separated from all other waste and organised by stream
- Every significant stream of hazardous waste **SHALL** be identified and recorded in the Office and/or Project Environmental Management Plan
- Hazardous waste **SHALL NEVER** be released untreated into the environment
- When transported, hazardous waste **SHALL** be properly classified, packaged and labelled, and necessary permits **SHALL** be obtained from authorities, if available
- Deviations from these guidelines **SHALL** be authorised by the most senior officer in the Office/Site and immediately communicated to the HSE Team in HQ.
- Burning of the hazardous waste is **strictly forbidden**

1. What is hazardous waste?

There are different ways of defining and classifying hazardous waste. UNEP defines it as “wastes other than radioactive wastes which, by reason of their chemical activity or toxic, explosive, corrosive or other characteristics cause danger or are likely to cause danger to health or the environment”. A simple way of describing it is as waste that is dangerous and can harm human health and/or the environment.

Non-hazardous waste can become so, if contaminated. If there is a doubt on how to classify a waste stream, this should be treated as hazardous on the basis of the precautionary principle. Additional guidance can be sought from hse@unops.org.

2. Common types of hazardous waste produced in UNOPS projects and or facilities

Hazardous waste **SHALL** be separated from all other waste and organised by stream; high diligence should be given to avoid that hazardous waste contaminates other waste streams.

Every significant stream of hazardous waste **SHALL** be identified and recorded in the Office and/or Project Environmental Management Plan, as well as in the Waste Management Plan (Form EM 02). Table 1 provides some examples of where common hazardous waste streams can be found in projects and office facilities, together with a short description of their environmental and health impacts.

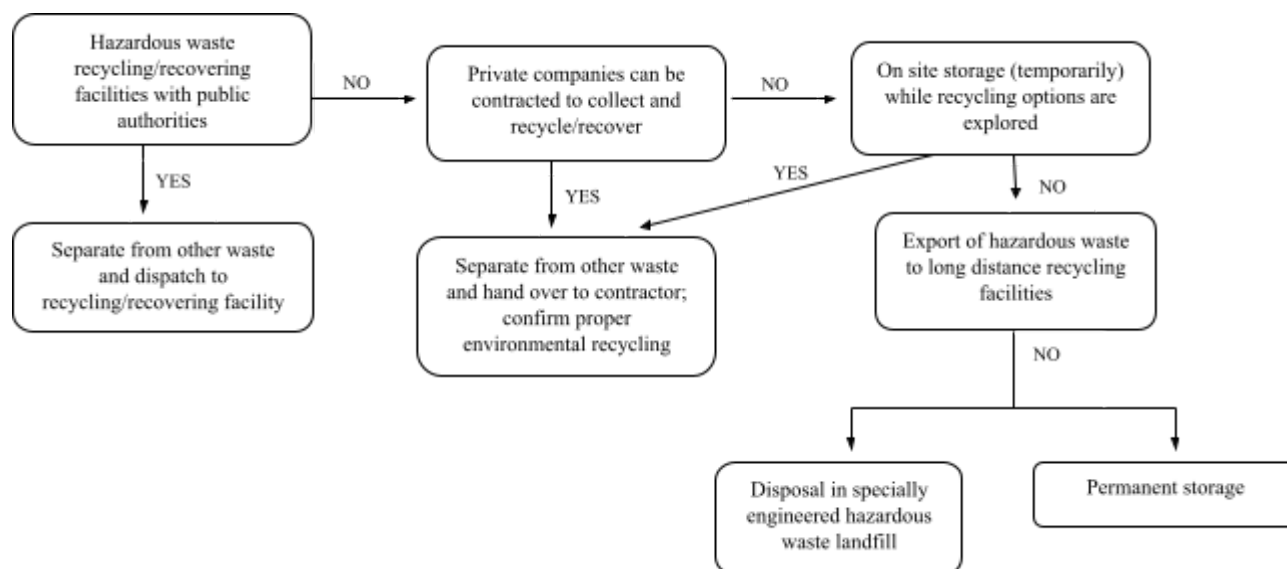
Table 1

TYPE OF WASTE	ENVIRONMENTAL AND HEALTH IMPACTS	WHERE THEY CAN BE FOUND
Used oils	Insoluble, persistent, can contain toxic chemicals and heavy metals, and is a major source of contamination of waterways	From vehicles, generators, other equipment and machinery, kitchens, etc.
Batteries	Contain toxic heavy metals such as lead, mercury, and cadmium	Small and large battery operated devices

Chemicals and pesticides	Toxic; can pollute waterways and may harm fish, plants and other living things	Cleaning products, disinfectants, pest control chemicals
Mercury containing equipment	Mercury is highly toxic to human body; persists and accumulates in the environment	Potential sources are batteries and paints, biocides and pesticides, electrical switches, contacts and relays, light sources, thermometers and other measuring devices, manometers and gauges, etc.
Paints and solvents	Toxic; can pollute waterways and may harm fish, plants and other living things	Material for finishing and decorations of buildings and facilities, wood preservatives, etc.
Electronics	A mixture of materials including some with hazardous potential, and scarce and precious materials as well	Computers, printers, laptops, phones, printers, etc.
Asbestos	Carcinogen when inhaled	Widely used in buildings (insulation, pipes, cement, etc) until the '80s
Pneumatic tyres	Tyres become an hazard to environment and health when uncontrolled open air burning occurs, generating smoke, oil and leaking toxic contaminants	All mobile vehicles and machinery

3. Options for safe recycling and disposal of hazardous waste

Hazardous waste **SHALL NEVER** be released untreated into the environment. Identifying proper disposal can prove challenging in locations where waste management infrastructure is weak or non-existent. It is recommended that a hierarchy of actions is followed, going from the best to least preferred option as illustrated in the graph below.



- Proper recycling and/or recovery of hazardous waste is always the preferred option. In countries and regions with well-developed systems, public authorities provide infrastructure to handle hazardous waste through processes such as physio-chemical treatment (transforming the hazardous substances into less hazardous ones), biological processes (mostly used for wastewater treatment), stabilisation/solidification (to immobilise and isolate from the environment hazardous elements that cannot be further treated with current technologies), thermal treatment (with control of incineration gases).
- In some cases, private companies may be providing similar services, including partial recovery of high value materials, and/or as part of their take-back or cradle-to-cradle production processes. If no public infrastructure is available, always enquire for available recycling services from private contractors. Due to the very high risk of the substances handled, a proper background check of the processes and facilities used by the contractor(s) is required, to confirm proper environmental management.
- If the hazardous waste cannot be processed in an environmentally sound manner locally or regionally, an alternative may be that of exporting to a location where this is possible. In this case, the hazardous waste **SHALL** be properly classified, packaged and labelled, and necessary permits **SHALL** be obtained from authorities, if local authorities issue these permits. Transportation of hazardous waste over long distances presents additional environmental impacts and risks. This option should be assessed against the alternatives of local disposal in landfill or permanent storage on site.
- If no alternatives are possible, hazardous waste may be disposed in landfill sites that have been properly engineered to contain the waste in isolation from the external environment.
- If no such sites can be used, the last resort is to store hazardous waste (semi-)permanently on a site, until other disposal options become available. This should not be used as a cheaper alternative to other preferable options. When selecting and preparing the site for storage, it is important that:
 - The location of the site must be agreed with local authorities, and in consultation with local stakeholders
 - Carefully select the site (not prone to flooding, landslides, etc.)
 - Select proper containers (inert, do not get attacked from the content, well-sealed)
 - Ensure waste compatibility when storing (i.e. ensure different types of hazardous waste that have potential of reacting with each other are isolated)
 - Ensure waste is properly marked using pictograms from the Globally Harmonized System of Classification and Labelling of Chemicals, using durable labels and with description in English and in local language(s)
 - Records, inventory and inspections should be monitored and kept on record
 - Access should be limited and controlled
 - Consider the hazards for personnel storing the waste, and provide them with adequate protection
 - All relevant stakeholders should be made aware of the existence of the site and of its hazard profile

- In some counties, controlled burning of hazardous material is performed according to local requirements and in properly engineered facilities. In any other situation, **burning of the hazardous waste is strictly forbidden.**

Any deviation from these guidelines **SHALL** be authorised by the most senior officer in the Office/Site and immediately communicated to the HSE Team in HQ.

4. Hazardous waste prevention

The best strategy in terms of hazardous waste management is avoidance. All reasonable efforts should be made to avoid the use of hazardous materials, or substitute with alternatives that are less hazardous or not hazardous at all (e.g. eco-labelled electronics contain lower levels of toxic materials, mercury can be substituted in several appliances, use waterborne paints and varnishes with lower VOCs and toxicity, etc.). Possible hazardous waste prevention and avoidance strategies include:

- Avoid releasing the hazard – e.g. asbestos is not hazardous to health if it is not airborne and breathable, thus special care should be given during demolition if there is even a suspicion that asbestos may be present in certain construction materials; tyres release hazardous material only in case of uncontrolled open-air burning
- Buy the right amount of products to avoid having to dispose of leftovers (e.g. paints, varnishes, pesticides, disinfectants)
- Store properly (in sealed container with proper labelling) for later use, or give back to the supplier for use in other sites (e.g. paints, disinfectants)
- Donate left overs to charity or other users (e.g. electronics).
- Ensure that, when donating highly hazardous materials such as used oils or fluorescent bulbs, the recipient knows how to dispose of them without contaminating the environment. UNOPS should not transfer the challenge of handling hazardous waste to people who have no capacity to do it.
- Make use of suppliers take-back schemes whenever these exist (e.g. electronics, toner cartridges)

Measures to minimize volume of hazardous waste generated should be recorded in the Office/Project Environmental Management Plan and relative Waste Management Plan (form EM 02).

Best practice: on-site bio-remediation of contaminated soil

It is common at project sites for minor fuel spillages to occur, leaving soil contaminated with hydro-carbons. When no treatment facilities are available, it is possible to treat this in-situ using biological soil farming processes. However, this should only be undertaken:

if there is enough time remaining on the project to effectively implement and monitor, or

if the beneficiary has adequate capacity to complete the process.

Indicatively, the remediation process will take approximately one year. The process for bio-remediation of the contaminated soil is as follows:

The site is lined with heavy plastic sheeting, and the area contained using bund walls made from densely packed grass or reeds. The area must be adequate in size with the containment method strong enough to withstand local climatic conditions.

The contaminated soil is spread in a layer to a maximum of 50 cm in depth, with urea fertiliser applied at the rate of 1 kg per m², once a month for 12 months. Lightly turn all the contaminated soil (manually) twice a month – once when applying the fertiliser.

The soil should be covered with a tarpaulin(s) during periods of heavy rainfall, making provision for drainage off the site.

Apply water if the soil becomes dry. It needs to be damp rather than saturated.

The soil should be tested prior to the land farming, and on completion to ensure that the process has been effective in removing the hydro-carbons. The soil should be designated for a non-production end use, such as landfill cover, or soil for construction in an area away from water courses.

Note that bioremediation is useful for hydrocarbons and other materials that can be broken down by microorganism. It should not be used for other hazardous wastes such as mercury compounds in fluorescent bulbs.

CHECKLIST ON SUFFICIENCY OF INFORMATION AND RESOURCES TO COMPLETE GENDER ACTION PLAN

Purpose: This checklist identifies whether there is sufficient information available to inform a Gender Action Plan, or whether it is necessary to allocate additional resources to conduct a gender analysis. If all answers to the checklist are 'yes', it is not necessary to complete a gender analysis to inform the Gender Action Plan. If any of the answers to the above questions are 'no', it will be necessary to conduct a gender analysis with the scope of filling in any information gaps identified in the checklist.

QUESTIONS		EXAMPLES	YES	NO	COMMENTS (IF ANY)
SOCIO-ECONOMIC CONTEXT					
1	Is there any relevant data on the status of gender equality in the local context of the project?	This may include a national and/or regional gender policy/strategy/framework, anti-discrimination or discriminatory national/local laws, available case-studies/research/reports to provide a baseline on gender equality and women's empowerment, etc.			
2	Is information available on gender norms or gender structures in the local context that may have an impact on the project?	Examples include information on local religious and/or cultural practices that prevent girls from attending school, or information on cultural practices that segregate and/or exclude certain gender groups.			
3	Is information available to identify opportunities for the project or advance gender equality and women's empowerment?	Examples may include involving local/community based women's groups in decision-making, initiatives to educate women about land rights, supporting women-owned businesses, incorporating the needs of women and girls in infrastructure designs to ensure equal access and use of systems and assets, etc.			
4	Is information available on potential risks if the project influences, advances or promotes gender equality and women's empowerment?	These risks may include risks to the project team from community members that are resistant to advancing women's equality and empowerment (e.g., do not want to encourage women owned businesses) and/or risks to project beneficiaries (e.g., from individuals or groups that do not want girls attending school). These risks may also include conflicts between stakeholders. For example, community members or local officials who are resistant to incorporating input and or contributions from marginalized groups (e.g., women indigenous leaders, LGTBI groups, etc.) in project design and implementation.			
5	Is information available to identify whether the project will cause or contribute to gender inequalities?	Examples may include information about project activities that contribute to discrimination towards any gender group (e.g., women, girls and/or marginalized/vulnerable gender groups and individuals), increase the burden on women and girls, and/or reinforce unequal representation in decision-making, etc.			

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QUESTIONS		EXAMPLES	YES	NO	COMMENTS (IF ANY)
STAKEHOLDERS AND INCLUSIVE PARTICIPATION					
6	Have local, regional, national and/or international gender and women's rights institutions and/or groups been identified for consultation, collaboration, networking and/or partnering?	This may include, potential networking and/or alliance building opportunities, including like-minded organizations (e.g., UN Women), development partners, multilateral partners, gender and women's rights groups, civil society organizations and grassroots women's groups.			
7	Have marginalized gender groups that might be impacted by the project and require special consideration been identified?	This may include women indigenous leaders or community members and LGBTI groups or individuals.			
RESOURCES AND CAPACITY					
8	Have the financial resources necessary to conduct the gender-specific project activities been identified?	These resources may include funds to support gender reviewers for infrastructure designs, community engagement workshops, a gender specialist to develop the Gender Action Plan, etc.			
9	Has the required capacity to implement and monitor the proposed gender activities been identified?	This capacity may include project team members with a sufficient understanding of gender considerations, a gender focal point whose time has been allocated to coordinate gender activities, a gender specialist to develop the Gender Action Plan and/or complete gender activities, community liaison, etc.			
GENERAL - PROGRAMMATIC RESULTS ON GENDER-RELEVANT SDGs					
10	Does the project have at least one project output that will contribute to meeting gender-relevant SDG targets? See below for a list of these indicators:	This may include any of the 80 gender-relevant SDG indicators. For example, building a maternity clinic contributes to SDG indicators 3.1.1: Maternal mortality ratio and 3.1.2: Proportion of births attended by skilled health personnel.			
	UN Inter-agency and Expert Group on Gender Statistics				

GENDER SCREENING QUESTIONS		Explanation
<p>Purpose: The gender screening informs the development of the project with regard to gender mainstreaming, in line with the UNOPS Gender Mainstreaming Strategy. Depending on the result of the screening, a project may need to complete a gender analysis and a Gender Action Plan (GAP) for inclusion in the Implementation Plan. A gender screening is mandatory for all three project categories.</p>		
Question 1: Is this a Category 1 project with no award of grants?	Yes	No
	There is no requirement to complete a Gender Action Plan.	Go to Question 2.
Question 2: Does the Partner (s) (Funding Source/Client) specifically request the exclusion of gender mainstreaming in the project scope? Answer 'yes' only if such exclusion will be explicitly written into the Legal Agreement and the respective Engagement Authority agrees to the exclusion.	Yes	No
	There is no requirement to complete a Gender Action Plan but this should be included in the risk register.	A Gender Action Plan is required, go to Question 3.
	Yes	No

Most Category 1 projects will not be required to complete further gender analysis or a Gender Action Plan (GAP), with the exception of Category 1 projects involving an award of grants (grants output group). If the answer to this question is 'yes', then the gender screening ends here. If the answer is 'no', the Business Developer must proceed to question two.

When the Partner(s) (Funding Source/Client) requests the exclusion of gender mainstreaming activities from the project scope, whether because the project is part of a larger programme and gender mainstreaming is being addressed by another project, or because of other reasons, this must be documented in the Legal Agreement. In addition, although answering 'yes' to this question will eliminate the requirement for a GAP, the exclusion of gender mainstreaming activities is a potential risk to the project and should be included in the risk register in oneUNOPS. If the answer to this question is 'no' then a Gender Action Plan is required and the Business Developer must proceed to question three.

GENDER SCREENING QUESTIONS			Explanation
<p>Question 3: Is there sufficient relevant information to inform the Gender Action Plan? Complete the checklist and answer 'yes' to this question only if all checklist answers are 'yes'.</p>	Create a Gender Action Plan as a sub-plan to the Implementation Plan.	Complete a gender analysis to fill any information gaps and create a Gender Action Plan as a sub-plan to the Implementation Plan.	<p>This question is asked only if the answers to the previous two questions were 'no'. Answering either 'yes' or 'no' to this question will require the completion of a Gender Action Plan. To answer this question the Business Developer must complete the Checklist on sufficiency of information and resources to complete Gender Action Plan, which is provided in oneUNOPS Projects and located in the Engagement Shared Drive. To answer 'yes' to this question, all questions in the checklist must be answered in the affirmative. If any question in the checklist results in a 'no', the answer to question three of the gender screening must be 'no' and will require the completion of a gender analysis to fill in any information gaps identified in the checklist.</p>

Protection of Water

The word '**SHALL**' in upper caps and bolded indicates a **mandatory requirement**.

General

Waters, including rivers, streams, ditches, ponds, lakes/lochs/loughs, groundwater and coastal waters should be protected from harm and pollution.

Pollution can result from any of the following entering a body of surface or groundwater: any poisonous, noxious or polluting matter or any waste matter (including silt, cement, concrete, oil, petroleum spirit, chemicals, solvents, sewage).

Common pollutants of water are:

- Garbage
- Silt
- Cement or concrete wash water (highly alkaline)
- Detergents
- Hydrocarbons, eg oil, diesel

It is vital to manage sites properly to protect the water environment and water supplies. A site does not need to be next to a river or other water body to cause a problem. Any pollutants getting into subsoil surface water drain or groundwater can end up in a river even if it is miles away.

Controls **SHALL** prevent the entry, or accidental spillage, of solid matter, contaminants, debris, and other pollutants and wastes into streams, flowing or dry watercourses, lakes, and underground water sources. Controls should be applied in a hierarchical manner i.e. applying control measures at source, if not possible at pathway, if not possible at receptor.

Consents and permits

Discharges to drains (foul sewer) or surface water drains or water bodies may require a formal approval (licence or consent/permit) from the relevant body/regulator.

It is therefore crucial to identify any discharge and abstract consents requirements from the local authorities and obtain them if necessary, before any work commences.

Prior to works commencement all drainage on site (and around site) should be identified.

To avoiding spillages on site:

- store liquids, solids and powders away from drains and waters,
- use of secondary containment, i.e. bunds around oil storage tanks, double skin tanks,

- use of drip trays around mobile plant,
- preferably only equipment in good condition (not leaking) should be used on site,
- designate area for refuelling – ideally on impermeable surface, away from water bodies and surface water drains; supervise deliveries,
- create designated wash out for concrete lorries – ideally it should be located at least 10m away from drains and waters,
- provide spill kits on site, ideally in vicinity of the areas where they may be used,
- place interceptors in drains to catch oils.

Managing effluent from vehicles, boot and tools washing

Vehicle wheels may need to be washed on site to avoid mud on public roads. Facilities should be provided for site workers to wash their boots to remove mud. Cleaning should be carried out in a bunded area and if possible water should be recycled (provided that is not contaminated).

If tools and equipment need to be washed, this should be undertaken well away from any waters or surface water drains on an area of hardstanding to avoid infiltration of potential pollutants into soils.

Surface water run off

Surface water run off should be managed so that it does not run into excavations, over disturbed ground or onto haul roads. Following actions should be considered for preventing and managing runoff and silty water:

- Endeavour to minimise land clearing and land shaping
- Allow a permanent stabilisation of disturbed areas as soon as land shaping is complete
- If possible and appropriate, use undisturbed areas as sediment buffer zones either during construction or on a long-term basis
- If possible endeavour to locate imported material and soil stockpiles in areas that minimise on-site traffic movement
- If possible plan works that cause ground disturbance outside of rain periods
- When undertaking earthworks ensure there is a buffer strip left to protect surface water
- If necessary, erect silt fences along the downslope or sideslope of disturbed areas
- Placing bunding or silt traps or cover around drains to prevent silt runoff

Areas of standing water **SHALL** be not allowed on site, as they may potentially create health and safety hazard for site staff and neighbourhood.

Discharge from site

- Silty or discoloured water **SHALL** not be discharged from the site
- Surface water runoff **SHALL** not be directly entering waters

- Water containing detergents SHALL not be allowed to enter either surface water drains or other surface or groundwater bodies

Monitoring

- Undertake regular (daily) visual inspections of waters at or near the site for signs of harm - look for any visible signs of discolouration in waters,
- If a settlement tank is used, ensure that water is not moving too fast and/or overflowing (other than at the discharge point)
- Check outfalls and pipework daily to ensure they are clean and clear of litter

Dealing with the water pollution:

- Pump to grassland or other soakaway – well away from excavations to avoid recirculation through the ground. The silty water should contain no chemical pollutants. This option is only suitable for water that is unpolluted aside from its silt content.
- Pump to sewer – consent from the sewage provider will be required
- Pump to settlement tank/constructed ponds/lagoons
 - A settlement lagoon (pond or tank) works by retaining water in an undisturbed state long enough for suspended solids to settle out. The clean water then either flows out at the discharge point or is pumped out.
 - The size of the tank/lagoon should be adequate for the settlement time required and the rate at which water flows or is pumped into it. A long, narrow, shallow settlement lagoon can help to maximise retention time of all water in the lagoon.
 - The tank should be periodically cleaned out to prevent a build-up of silt.
 - Regular inspect/monitoring of the outflow quality should be undertaken
 - Depending on the legal requirements, a consent/licence to pump clean water from the surface of settlement lagoons into waters or a designated discharge point should be sought from the local authorities
- Pass through a filtration system
- Discharges with fairly coarse particles (but no other pollutants) and relatively small flows may be treated easily and cheaply by passing them through steel tanks or even skips filled with a suitable filter, such as fine single size aggregates (5 to 10 mm), geotextiles or straw bales.
- Pump into a tanker and dispose of off site (most expensive).

Use water on site:

It is good practice on site to consider water use needs and to seek to reduce these wherever possible, to reduce the need to use potable water from taps.

Some construction activities, for example concrete batching or dust suppression, require water to be abstracted from surface water or groundwater. Water abstraction cases need to be carefully managed, as they can potentially lead to:

- shortages in water supply
- increased pollution due to reduced dilution of pollutants
- damage to habitats

For each abstraction case an impact assessment must be prepared and agreement (abstract consent) from the relevant authority obtained.

Working over or near to water:

- Ensure that a comprehensive risk assessments is completed for activities that involve working near or over the water,
- Preferably no site works should occur within 10 m of the edge of waters,
- Avoid storing fuel near water,
- Spray, dust or other airborne materials should be prevented from entering waters (i.e. erecting dust screens on bridges, use of decking/barges below the works - acting as a bund in case of spillage)
- Check if the banks or bed of waters outside the area of the works are not being affected by site operations (discharges or vehicle movements etc)
- Regularly check waters downstream of the works to see if these are silted or discoloured or if there is an oily sheen visible on the water
- Plan for emergency – ensure that spill kits (or booms across the river to contain pollutants) are available, ensure that site staff is aware of the location of spill kits and knows how to use them.

Dealing with water in excavations

- Prevent water from entering excavations,
- Manage groundwater flowing into excavations - install cut off ditches, walls or well point dewatering
- Make sure that water pump out from the excavation is passing through the settlement tank

Wastewater Management

The word '**SHALL**' in upper caps and bolded indicates a **mandatory requirement**.

Level of provision of the sanitation facilities on site will depend on the number of people working on the site, duration of the project and local conditions.

If possible, drainage from site facilities (toilets, washing facilities, kitchen) should be connected to the sewer network in the area. Such connection will require obtaining consent from the relevant authority.

Alternatively, temporary toilets can be provided on site and their content should be regularly tankered away and disposed in a responsible manner – sewer network, sewer treatment plant. Any discharge must be agreed with the relevant authority.

Septic tanks can be installed, provided that:

- If water table is too high, tank should be lined with clay, plastic sheeting or some other impermeable material to prevent leakage
- Direct discharge of effluent to waterways should be avoided if possible. Direct discharge of the effluent to waterways with sufficient volume and flow to assimilate the waste may be acceptable. It is recommended to add a secondary treatment, such as passing effluent through an anaerobic filter, followed by discharge to an absorption field, or better yet, a constructed wetland.
- Sewage from showers and washing facilities can be directed straight to the soak drains.
- A system for sludge removal and transportation of the collected material off-site for treatment should be provided.
- The collected sludge must be adequately treated and not directly applied to fields or otherwise improperly disposed of.

Main considerations for design and installation of the septic tank:

- The tank **SHALL** be structurally sound and water tight,
- Tank should be large enough to serve number of the users and provide suitable conditions for the settlement, storage and partial decomposition of solids.
- The capacity of the tank (C) can be calculated in the basis of the number of users (P):

$$C = 180 * P + 2000 \text{ [litres]}$$

- The tank should have as a minimum two compartments, with the first chamber providing at least 2/3 of the total capacity.
- A proper access for maintenance should be allowed.
- Tanks should be equipped with the ventilation pipes.
- If possible single soak point should be avoided; a drainage field should be constructed.

- Drainage trenches should be constructed as a min 2 m away from each other, with the 300mm granular material below the distribution (perforated) pipe.
- A drainage field **SHALL** be downstream of any water sources, with at least 50m distance.

Discharging untreated sewage to the water body is strictly prohibited.

If drainage or treatment facilities are not available locally, it is recommended review the local conditions and provide sanitation facilities similar to the local ones.

In absence of any systems it is recommended to undertake consultation with the local community and explore opportunities to improve sanitation conditions in the area. This may involve conversion of the temporary facilities constructed for the project into permanent structure used by the community, if feasible.

Preventing a contamination of groundwater sources should be the priority, and that depends on several factors:

- Type of toilet – the rate of flow of pathogen-containing liquid from latrine pits to the soil beneath is proportional to the quantity of liquid in the pit (static head). Dry toilets present the smallest risk of groundwater contamination.
- Water table – a latrine pit must be above the water table during all seasons. 1.5m above the surface is the minimum depth necessary to ensure the pit contents remain dry, however recommended distance is 2.0m.
- Soil type – Clay, silt, and fine sand soil types all have grain sizes small enough to act as natural filters for microbial contaminants (<0.2mm).
- Distance to nearest water source – the risk of contamination of a surface or groundwater source by a toilet depends on the distance to the source, the direction and velocity of the flow of water in the soil (hydraulic gradient), and the soil/rock permeability. 30m is considered the minimum separation for most soil types, however recommended distance is 50m. Toilets shall be always located downstream of any water source.

Additionally, direction of the wind should be taken into the consideration and potential odor and fly nuisance.

Sanitation facilities should not be constructed in the areas prone to flooding or if this is not possible, they should be flood protected by raising their level.

Following options for sanitary facilities can be considered (based on the recommendation of the WaterAid, USAid for sanitation solutions in the rural areas of the developing countries):

Pit Latrine (PL) or Ventilated Improved Pit (VIP) latrine

- Pit latrines should not be installed where the water table is shallow.
- The pit **SHALL** be least 3m deep and, if necessary to attain this depth, the floor level of the building above it should be raised above ground level.
- Recommended dimension of the pit for the family of five is 1.2m, for design period 3-5 years.

- For PL lid should be provided over the hole to minimise odour and fly nuisance, for VIP latrines the room should be well ventilated so as to allow the flow of air into the pit.
- The VIP latrines SHALL have a vent pipe which should be at least 100mm in diameter and should extend from the pit to about 1m above the roof, it should be fitted with fly screen
- In unstable ground the pit walls should be supported with timber, bricks or blocks.
- Single or double pits can be provided.
- For single pit - when it is full, it should be covered with leaves and soil and a small tree is planted on top to grow in the compost. No handling of the waste is required.
- In double pits, while one is filling with excreta, the second pit remains out of service. When the first pit is filled with excreta up to about 50 cm below the slab, it is taken out of use and the remaining space is filled with grass and vegetation materials that can be composted. The second pit should be then used until is full. The first pit will stay sealed for a period of 6–12 months (depending on the climate), during which time the waste will decompose and any pathogenic microorganisms will die. After this period, the material (humus soil) in the first pit can be taken out manually.

Composting toilets

- Humidity of composting material should be maintained above 60% and excreta supplemented with generous quantities of carboniferous material (dry leaves, straw, etc.). The pile should then remain aerobic, odor-free and insect-free
- Vaults should be constructed as sealed vaults to hold composting material if using fixed-batch systems.
- Test samples should be taken from active chamber and mature chamber after fallow period for Ascaris eggs and fecal coliforms
- Sufficient residence time should be allowed in mature chamber. This may vary from 6 months in warm climates to 18 months in cooler climates
- The systems must be properly operated and maintained so that the soil amendment taken out after the treatment period is truly sanitized

Dry toilets

- In a dry toilet ash or lime mixed with dry soil are added to create a dehydrating environment for breakdown and die off of pathogens.
- Humidity of composting material should be maintained below 20% and excreta supplement with alkaline material (ashes or lime). The pile should then remain both odor free and insect free. Generous applications of ashes will help ensure that pathogens are destroyed.
- Sealed vaults should be constructed to hold dehydrating and curing material.
- The toilet paper should not be added to the dry toilets.
- The systems must be properly operated and maintained so that the soil amendment taken out after the treatment period is truly sanitized

- Test samples should be taken from active chamber and mature chamber after fallow period for Ascaris eggs and fecal coliforms
- Sufficient residence time should be allowed in mature chamber. This may vary from 6 months in warm climates to 18 months in cooler climates

Pour Flush Latrines

- Uses principle of the cistern flush toilet, but water is pour manually, on average 2-3 liters of water is required per flush
- Sewage is disposed to a septic tank or seepage pit
- To prevent smells rising from the pit a U-bend water seal can be incorporated.
- For further information on design of the pour flush latrines refer to <http://water.worldbank.org/publications/design-pour-flush-latrines>

For all installation hand-washing facilities **SHALL** be provided.

Borrow Pit Management

This document provides guidance on management of borrow pits. The Contractor should remain responsible for managing borrow pit operations.

Borrow pit site reclamation (also called reinstatement) must be completed prior to handover of the road section to which the borrow site was used.

1. Site assessment and selection

A preliminary site assessment prior to undertaking excavation works should be undertaken. Such assessment shall include as a minimum the following:

1.1. Land tenure and approval for use

- A written approval for use of the proposed site shall be obtained from the local authorities. It is recommended to commence discussion with relevant authorities as soon as possible to understand requirements and potential limitations of the process. Negotiation may require preparation of the narrative that describes borrow pit operations, outlines potential risk to the community, proposes mitigation measures to control and minimise such risks and presents restoration plans.

1.2. Geotechnical site investigation

- Borehole drilling and/or excavation of test pits shall be carried out to confirm the extent and quality of the materials within the proposed site. Test pits and boreholes shall be decommissioned unless used as a borrow site.
- Hydrogeological information shall be obtained to determine the presence and depth of any groundwater table.

1.3. Site property lines and location

- Borrow pits should be preferably located in the areas with minimal volume of vegetation or existing/decommissioned pits can be used.
- The borrow pit site shall have clearly defined property lines which will be surveyed and clearly marked to limit excavation within the approved area of the site.
- The size of the area to be excavated shall be a maximum of 10,000 m² (or 1 ha). Larger area may be excavated upon written approval from the UNOPS representative.
- The borrow pit operational site must have an undisturbed buffer area of natural vegetation of a minimum of 25 meters in width around the perimeter of the site – excluding entry roadway with a maximum width of 5 meters.
- The property line of the site shall be a minimum of 100 meters from the nearest households and 100 meters away from the nearest watercourse.

- Location of the borrow pit place shall be well documents. Documentation should include: a map showing the location and a plan-view of the site, a photographic record of the site in its undisturbed state (photographs should be taken from the geographic center of the proposed site in 8 directions: north, northeast, east, southeast, south, southwest, west, and northwest).

2. Borrow pit operations

During borrow pit operations as a minimum good management practices shall be followed:

2.1. Operational area

- Site area shall include: area of extraction, a buffer zone, perimeter berm, stockpiles (i.e. top soil and overburden) and area for general operations.

2.2. Stockpiles

- Topsoil depth ranges between 150 mm and 500 mm. The exact depth shall be determined from the geotechnical site assessment. Topsoil shall be stripped and stockpiled away from other materials. Topsoil shall be only used for reclamation purposes when pit operation is complete.
- Overburden soil (i.e. the layer of soil below the topsoil and above the material of interest) shall be used as a perimeter berm to direct drainage on the site or stockpiled separately from topsoil and later used to landscape and backfill exhausted areas of the borrow pit.

2.3. Excavation slopes

- Pit excavations shall be a maximum of 6 meters in depth with a maximum allowable horizontal to vertical slope (H:V) of 2:1 or 50% grade.
- One side of the excavation shall have a maximum horizontal to vertical slope (H:V) of 2.5:1 or 40% grade for efficient operation of heavy equipment and to allow for ease of access.
- Pit excavations greater than 6 meters must be fenced all round.

2.4. Duration of operations

- An estimated lifespan of site should be given based on the geotechnical assessment, anticipated rate of extraction and planned site reclamation.

3. Environmental and safety management

The Contractor must undertake the following environmental protection and public safety measures:

3.1. Site Access/Safety

- The extraction site should have a barrier such as yellow warning tape and/or perimeter berms to control or discourage public access. Alternatively, the Contractor can post a local full-time guard until the site is reinstated.

- Any deep excavation site that has standing water greater than 0.75 meters deep must be protected from public access by installing a fence and/or posting a full-time guard before the water level goes down.
- Entrances to the site should be gated so as to block ease of access and shall be designed to provide vehicles with adequate sight distance to avoid a safety hazard.
- Durable warning signs shall be posted around the perimeter of the borrow site not more than 50 meters apart which will provide symbols of danger and no trespassing (e.g. skull and crossbones).
- Liaison with the local community should be undertaken, which includes information on dangers within borrow pit operational sites and that trespassing is not permitted.

3.2. Visual

- Ensure that existing vegetation within the minimum 25-meter buffer area is not disturbed, as it should provide some visual screening of pit operations from the road and nearby residents.

3.3. Noise

- Ensure that existing vegetation within the minimum 25-meter buffer area is not disturbed, as it should screen noise of pit operations from nearby residents.

3.4. Water

- If water is needed for borrow pit operations, a water extraction points such as a borehole, shall be established within the site, ideally located near the perimeter of the property for use by the local community once the site is reinstated.
- Borrow pits shall not be located within a wetland area.
- Excavation below the water table is not permitted.
- Standing water in the borrow pit is not permitted and shall be removed either through drainage structures and/or pumping. Alternatively, any pits with deep (greater than 0.75 meter) pools of water must be secured by a fence and/or full-time guards to prevent public access.
- Under no circumstances shall community members be allowed to use water at an active borrow pit site for any purpose (e.g. watering their animals, washing clothes, etc.).

3.5. Water discharge

- Overburden soil can be used as a perimeter berm to direct drainage away from the site.
- Efforts shall be made to reduce the amount of runoff into the borrow pit.

3.6. Erosion

- Erosion control measures must be undertaken in all aspects of pit operations including stockpiles and access roads. These measures include reduced slopes, seeding, and stockpile covers to protect stockpiles and the adjacent land.
- Topsoil stockpiles shall be protected from wind and water erosion by reducing slopes (i.e. less than 50% grade), using a covering, and/or spraying with water.

3.7. Dust

- In all operation of the borrow pits, measures shall be undertaken to minimise dust emission and spreading (water sprinklers, covering stockpiles, introducing speed limit, etc).
- If a rock crusher is used, the dust control measures shall be undertaken by using a water truck or fixed sprinklers on crushing equipment.

4. Site reclamation

Site reclamation (reinstatement) should be completed prior to handover of completed road section.

4.1. Stockpile reuse

- Overburden stockpiles and perimeter berms shall be placed on the excavated site and graded to the desired slopes and drainage paths.
- Reserved topsoil shall be spread on top of the overburden with more topsoil focused on sloping land (minimum depth on slopes: 150 mm).

4.2. Final slope and drainage

- Suitable surface slopes together with drainage ditches and conduits – as needed – shall be constructed to prevent water from collecting at the site.
- Final slopes within the site shall be a maximum horizontal to vertical slope (H:V) of 3:1 or 33% grade.

4.3. Final cover

- The borrow pit operational site including access roads shall be thoroughly scarified as needed to help establish adequate vegetative cover.
- A minimum of 75% of vegetative cover should be established and maintained following the first rains after reclamation.
- Particular focus shall be given to vegetation cover on the side slopes of the excavated area to minimize erosion. Any required seeding used shall be of local plant varieties.

4.4. Interim reclamation

- When excavation activities are going to cease for longer than 60 days, interim reclamation measures should be undertaken to protect the environment and public safety.
- Interim reclamation measures include a minimum of seeding of topsoil stockpiles and grading the site to reduce erosion potential.

Preservation of Historical, Archeological and Cultural Remains

Protection of the historical, scientific, geological and archaeological findings is an important part of the process of preservation of the world's cultural heritage.

Known sites of the historical, scientific, geological and archaeological importance **SHALL** not be considered for location of the project, unless the aim of the project is preservation of the site.

Potential for the presence of the areas of historical, scientific, geological and archaeological importance **SHALL** be identified at the project initiation stage, through the Environmental Assessment process. Consultation with the relevant authorities and local communities will be necessary.

If areas as described above are located in the vicinity of the project site, they **SHALL** be suitably protected, depending on the intrusiveness of the site activities, by fencing, screening, sheet piling etc.

In locations, where there is a potential for discovering items of the historical, scientific, geological and archaeological importance, it is recommended to undertake the trial pits, prior to commencement of any substantial excavation.

If evidence of possible scientific, historical, geological, archaeological or cultural interest or value during the execution of the works is discovered, work in this area must be stopped immediately. The UNOPS representative shall be notified on the nature and location of findings.

A reasonable precaution and care must be exercised so that artefacts or fossils uncovered during excavation operations are not damaged. The area shall be isolated/fenced off.

The relevant authority must be informed on the findings as soon as it is possible, furthermore assistance and cooperation with the Authorities and experts shall be assured.

Site Induction Register

Project Title	
Site	

Induction No.	Employee Name	Employee Signature	Employer	Date Inducted	Inducted By

Visitor Induction Register

Project Title	
Site	

Date	Visitor Name	Signature	Organisation	Time In	Time Out	Briefing By/ Supervising Visit (UNOPS staff)

Name of Office:	
Year:	

Instructions:
Step 1: Under "Personnel information", indicate the name, title, and organization of any training participants.
Step 2: Under "HSSE training":
a. indicate the name of any mandatory, planned, and implemented health, safety, social and environmental training - both online and face-to-face, and for both offices and projects.
b. indicate the date that the training was taken by the relevant personnel.

Personnel information				HSSE training							
#	Name	Title	Organization	[Name of training 1]	[Name of training 2]	[Name of training 3]	[Name of training 4]	[Name of training 5]	[Name of training 6]	[Name of training 7]	[Name of training 8]
1				Indicate below the date that the training was taken [DD-MM-YYYY]							
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Mandatory HSSE inspections

Introduction

The purpose of this Guideline is to assist UNOPS facilities and operations in conducting health, safety, social and environmental (HSSE) management inspections, identifying issues, and implementing corrective actions which are part of a larger HSSE value chain. Carrying out HSSE inspections allows UNOPS to prevent injuries and illnesses by identifying unsafe conditions, unsafe acts and instances where health and safety controls are not in place or are not effective to the desired level. Identifying these gaps would be futile if corrective actions are not carried out. Therefore, a key part of the inspection process is ensuring that the actions identified are carried out in a way that effectively addresses the unsafe conditions or acts, and ensures that harm to people and the environment, and damage to property do not occur.

1. Who conducts the inspections?

1.1. Projects: For project sites, the project manager is responsible for ensuring that inspections are carried out and that the corrective actions identified are effective. UNOPS personnel and contractors (implementing or supervising) conduct the inspections. It is recommended that at least two people conduct an inspection. Inspections may be carried out by the supervisors, technical experts (engineers, HSSE practitioners), workers' HSSE representatives, project managers, and other managers. The involvement of managers at planned intervals is strongly encouraged. This does not mean that the inspections should always be announced to the people at the site, rather it means that there should be an inspection plan that shall be followed so that inspections are done at a certain predetermined frequency. A combination of announced and unannounced inspections should be used to allow people to make a deliberate effort to address known issues and also to see the conditions when the site team is not expecting visitors to the site. Inspections conducted by the contractors must be checked by UNOPS personnel and should cover the key aspects highlighted in the [HSE05 Site HSSE Inspection](#) form. Mine Action projects shall follow quality assurance requirements as set out by relevant National or International Mine Action Standards.

1.2. Offices: For offices, the HSSE Country Coordinator (or another colleague in the local office assigned by the HSSE coordinator) is responsible for conducting the inspection, addressing the hazards and risks and identifying the corrective actions using the [HSE06 Office HSSE Inspection](#) form. Similar to project sites, it is also recommended that at least two people carry out the inspection of offices and facilities.

2. Workplaces or “sites” that require inspection

The ISO 45001 standard defines the workplace as a “place under the control of the organization where a person needs to be or to go for work purposes”. For UNOPS this means that we apply HSSE requirements in all UNOPS premises including offices, warehouses, accommodation and project sites. Although UNOPS hands over sites to contractors for the execution of work, the sites remain UNOPS workplaces from an HSSE point of view as the contractor is our agent who is executing work on our behalf. Therefore, any accommodation, storage, raw material or waste processing premises that are used by UNOPS or contractors to exclusively support UNOPS activities or projects are covered by UNOPS HS requirements. The HSSE requirements also apply when UNOPS has been hired by a partner to supervise a contractor who is carrying out the work.

Project teams must determine a practical way of defining the workplaces to be inspected based on the nature of the project and the context. For example, it may make more sense to have one inspection of a 600m sewer line than to have seven inspections of the seven inspection holes that are in the 600m sewer line. In contrast, it may make more sense to have three inspections for a 45 km road that has been divided into three 15km lots assigned to three different contractors. For a camp management project, it may also make sense to have three inspections with one covering cleaning operations in the UN compound office areas, another covering operations in the residential areas, and another covering the waste handling and landfill areas.

While the determination of the number of workplaces or locations where inspections should be carried out is at the discretion of the project manager (PM), PMs are strongly encouraged to have an inspection plan for the project that defines the workplaces to be inspected and the frequency of the inspections, bearing in mind that the purpose of the inspection is to ensure that key HSSE controls are in place and working.

In general, the requirement for inspections is that at least one HSSE inspection shall be carried per week for all physical sites, however, the HSSE unit in HQ should be consulted to give a written instruction to reduce the frequency of inspection when the risk is considered to be low. Emails should be directed to hse@unops.org. It should be noted that the one inspection per week is only a minimum performance level expected. Higher risk projects should ensure adequate inspection and supervision of safety-critical tasks beyond the one formal inspection highlighted. Mine action projects will conduct inspections (or quality assurance) in line with relevant National or International mine action standard requirements.

The inspections of UNOPS offices should cover all office spaces, premises, UNOPS accommodation, warehouses and any other premises directly associated with UNOPS work. Another inspection should be carried out if the location of some of these facilities is so far that it is not practical to carry out the inspection at the same time, for instance if there are office premises in different towns.

3. Frequency of the inspections

The current minimum requirement for HSSE inspections is that all projects with physical sites that are under the control of UNOPS or its contractors should carry out at least one formal HSSE inspection per week. Mine action projects must follow relevant National or International Mine Action Standards, which determine the required frequency of quality assurance inspections. UNOPS offices should carry out at least one inspection every six months. Although the minimum frequency for office inspections is once every six months, it is recommended that offices put in place a monthly or quarterly inspection programme in all locations.

The frequency of formal inspections should be increased when the project or office has high HSSE risks. A formal inspection is one that is properly recorded on the HSE05 and HSE06 forms, or equivalent forms that have been accepted by the UNOPS technical expert (for projects) or an HSSE Specialist at HQ (for offices).

4. What are verified and completed actions?

Responsibility for the verification of inspections conducted lies with the respective Project Managers. The Project Manager should ensure that inspections are done and that corrective actions identified in the inspections are completed and effective.



There is a need for verifying that key actions to address issues raised by the inspection have been addressed. The Project Manager can verify the inspections in person by going to the site or through pictures, video, or other evidence showing that aspects requiring attention have been addressed. The Project Manager may also delegate part of the verification to the Deputy Project Manager or another senior colleague in the project when he/she is not available, however, it is important that the PM shows leadership by being directly involved in addressing key HSSE aspects.

Inspection findings made must be prioritized by the level of risk so that the highest risk findings receive the most urgent attention. The PM should escalate any high risk findings that he/she is not able to address immediately to his/her supervisor in the country and to the project executive (if these are different people). The supervisor or executive shall help the PM to address the finding in a way that quickly and effectively mitigates the possibility of death or serious injuries.

A responsible person and a completion date must be assigned to inspection findings that require further action. See the example below of a high risk finding that resulted in work being stopped and where the corrective actions were implemented on the same day before work could be resumed.

Corrective Actions for Mine Action projects must be completed in accordance with relevant National or International Mine Action Standard requirements. It is the responsibility of the Chief of Operations (or equivalent) to ensure corrective actions from Quality Assurance visits are completed and effective.

Example: HSE05 Site HSSE Inspection

* Priority: (A1)– Immediately (A2) – Within 24 Hrs (B3)– Within 3 Days (C)– Other (state)				
Category	✓	Observation(s) – add rows if necessary	Responsible	Date closed
3. Work at Height	✓			
Scaffolding (foundation, bracings, access, handrails, toe boards, tagging) Mobile platforms, ladders (locking, securing, tagging) Fall protection (edge protection in place, fall arrest systems, openings fenced off or covered)		 <p>A1 - Lack of/inadequate fall protection</p> <p>Corrective actions: Immediately stop work. Edge protection should be put in place, provision of fall arrest system is required and openings should be fenced off or covered, and personnel should be trained on working at heights</p>	John Doe 20/01/2020	20/01/2020 Edge protection installed, workers issued with safety harnesses and trained 

Name/Signature of Person carrying out Inspection:	<i>Jane Doe</i>		
Approved by Project Manager	<i>John Smith</i>	Date	20/01/2020

Inspections are said to be **mandatory inspections with corrective actions completed and verified** when:

- the PM confirms that the findings raised in an inspection are resolved at the site;
- the PM escalates the inspections with findings to a higher authority for action, and the action recommended by the higher authority has been initiated; or
- formal HSSE inspections are conducted and there are no inspection hazards or risks identified. In these cases, the system should take note of the inspection.

5. In-country escalation mechanism

There is a need for a functioning in-country escalation mechanism for findings from inspections and their corrective actions. The purpose of the escalation process is for ensuring that unsafe conditions and acts receive attention as soon as possible before they lead to injuries or illnesses. It is recommended that site personnel should immediately advise the PM of aspects that they are unable to address through the inspection report and the PM also advises his/her superiors of aspects that he/she has difficulty addressing so that the aspects are given adequate attention quickly. Note that the in-country escalation mechanism depends on the context and individual needs of the country.

Maintaining information on the type and nature of high risk aspects that need escalation and the tracking of corrective actions for these aspects is valuable for in-country review and analysis. Countries should also make use of performance information generated from HSSE monthly reporting and displayed in the corporate HSSE dashboard. It is recommended that the high risk findings that require escalation should be recorded in the project issues register.

Project Emergency Contact Numbers

Project Title			
Project Location			
Contractor			
Date of issue		Revision	

Service	Telephone Number	Name/Details/Address
UNOPS representative		
Contractor Contact		
Site First Aid givers		
Nearest Doctor		
Nearest Medical Clinic /Hospital		
Ambulance Service		
Nearest Fire Service		
Nearest Police Service		
Services Providers Electricity Water Service Gas Service		
Other		

GUIDELINE GHS10**SIGNIFICANT ACCIDENT OR INCIDENT RESPONSE**

A Significant Accident or Incident is an event with serious or extreme consequences. Such events would include multiple major injuries, a fatality, a major environmental incident or an extreme failure of a product, structure, element or service.

This guide does not replace relevant UNOPS Organizational Directives (OD's) and Administration Instructions (AI's) relating to communications, reporting lines and responsibility with regard to safety, security, risk and continuity planning. The aim of this document is to assist in the site team's immediate response to a significant event on a construction project with the aim to attend to immediate physical needs of any injured parties and contain and control the overall situation to minimise further loss, injury or damage.

Immediate Action

UNOPS most senior member of the site team at the scene of the Accident/Incident should seek to respond in the following way.

- Immediately take control of the situation and implement the relevant steps outlined below.
- Contact relevant emergency services (local, government, UN, if available)
- Ensure that injured persons are attended to by first aiders and secondly that appropriate steps are taken to facilitate further critical medical treatment (i.e. stabilise and wait for ambulance/emergency services, or facilitate emergency transport of injured to nearest clinic/doctor/hospital facility)
- Make the site and surrounding area safe, this may require emergency barriers and cordons depending on the nature of the incident. The evacuation of the site and neighbouring properties may also be necessary.
- Notify your UNOPS line manager of the situation
- Leave to accident location as undisturbed as possible. However it may be required to disturb the location to affect a rescue or stabilise an area to make it safer where a dangerous situation still exists.
- Endeavour to ensure that injured workers or employee's next of kin receive the earliest notification of the accident (this may be in association with the local police and UNOPS senior management where appropriate).

Secondary Actions

Once the situation has stabilised with injured persons off the site and receiving treatment and/or the dangerous incident is controlled, situation stable with little or no risk of further injury or damage, then the following actions can be considered.

- Begin to gather evidence regarding the Accident/Incident. Take photos, video and sketches as required. Identify witnesses to the event and record statements.
- Begin to fill out the Accident/Incident report for significant events – **Form HS16**.

GUIDELINE GHS10

- UNOPS senior management should meet as soon as possible to plan and establish roles and responsibilities for managing the incident.

Tasks which may be required include

- Establishing ongoing contact, support and relationship with injury parties and their families
 - Establish a project/site recovery plan to allow resumption of works
 - Establish an appropriate internal communications plan for communicating with the donor, donor community, and beneficiary, local media/press, police and general public
 - Insurance and or legal considerations to be reviewed
 - Possibility of external investigation? Plan to manage and co-operate with investigators if applicable
 - Consider the need to establish a UNOPS Accident/Incident investigation team
- Maintain all records of evidence and any materials or documents relating specially to the incident.
 - The aim of any report or investigation has to be to understand the causes of the incident in order to prevent recurrence. Ensure clear actions and tasks are identified and undertaken to eliminate the causes of the incident before operations on the project/site resume.

GUIDELINE GHS10

Incident Report Form

2) For each type of incident, select the relevant descriptor(s) from the list. You can select up to 5 descriptors for each type of incident. If a descriptor is not listed below, please type in short descriptor in "Other". Add more rows as necessary.

Project/Office				Incident type	Descriptor 1	Descriptor 2	Descriptor 3	Descriptor 4	Descriptor 5	Other
Report date				H&S						<i>Please type in short descriptor here</i>
Reported by		Title/role								<i>Please type in short descriptor here</i>
I. DETAILS OF THE INCIDENT				Environmental						<i>Please type in short descriptor here</i>

Incident date	
Incident time	
Incident place	

Provide description of the immediate causes of the incident:

Incidents are classified into two classes, as below. You can select either Class 1 or Class 2, not both. Select the Class that better describes the type of incident. You can select multiple sub-categories under each class.

Incident class	Category 1	Category 2	Category 3	Category 4	Category 5
Class 1					
Class 2					

III. DESCRIPTION OF THE INCIDENT

Record all facts prior to and including the incident, if it was a planned activity, describe/list material, ecosystem and property damaged, etc:

II. IDENTIFICATION OF TYPE OF INCIDENT AND IMMEDIATE CAUSES

1) Select the type of the incident from the list below. An incident can be classified at the same time as H&S/environmental/social.

Type of Incident - H&S		Type of Incident - Social
Moving Machinery/vehicles at project site	Dust, Fumes, Vapours	Misuse of UNOPS property
Fall from height	Noise	Damage to Cultural Heritage
Powered Hand tools	Temperature or heat	Occurrence of infringement of labour rights
Hand Tools	Overexertion	Occurrence of infringement of human rights
Animals or insects	Structural Failure	Stakeholder/community complaint
Fire or Explosion at project site	Chemical/biological	Strike, demonstration

IV. ROOT CAUSE ANALYSIS

Select the root cause(s) of the incident from the list below. If "Other" please specify.

Trips & smaller falls	Stress	Other (please specify)
Drowning	Other (please specify)	
Borrow-pit Management		

Type of Incident - Environmental	
Chemical/Oil Spill	Damage to ecosystems (e.g. damage to flora/fauna)
Improper Disposal Waste	Odour air Emissions
Disasters (Earthquake, Flood, etc)	Dust, Fumes, Vapours, Air pollution
Water Pollution/ Sedimentation	Other (please specify)

* note that incidents related to terrorism, civil unrest, armed conflict and crime; as well as fire, aviation safety and road transport, are under the responsibility of the UN Security Management System, and should be reported to UN Security using the security incident form. Incidents at contractor operated project sites should be reported through this incident report form.

Root causes	Yes	No
Improper Planning		
Poor Maintenance		
Poor Supervision		
Poor Quality of Equipment		
No rules, standards, or procedure		
Lack of knowledge or skills		
Improper motivation or attitude		
Failure to comply with rules		
Other		

Incident	Type of Incident - H&S	Type of Incident - Environmental	Type of Incident - Social	Immediate causes - H&S	Root causes - H&S	Immediate causes - Environmental	Root causes - Environmental	Immediate causes - Social	Root causes - Social	Immediate HS and Env	Root HS and Env
Fatal	Moving Machinery/vehicles	Chemical/Oil Spill	Theft	Operating Without Authority	Improper Planning	No waste segregation	Improper Planning	Population displacement	Improper Planning	Operating Without Authority	Improper Planning
Lost-time	Fall from height	Improper Disposal Waste	Misuse of UNOPS property	Failure to Warn or Secure	Poor Maintenance	Unsafe management of hazardous waste streams/storage	Poor Maintenance	Population density/movement increase	Poor Supervision	Failure to Warn or Secure	Poor Maintenance
Major environmental	Powered Hand tools	Disasters (Earthquake, Flood, etc)	Willful Damage	Operating at unsafe Speed	Poor Supervision	Burning of waste	Poor Supervision	Weak prevention of discrimination	No rules, standards, or procedures	Operating at unsafe Speed	Poor Supervision
Major property damage	Hand Tools	Water Pollution/ Sedimentation	Damage to Cultural Heritage	Using Defective Equipment	Poor Quality of Equipment	No use of spill kits/ sedimentation tanks	Poor Quality of Equipment	Weak community engagement	Lack of knowledge or skills	Using Defective Equipment	Poor Quality of Equipment
Reportable social	Animals or insects	Damage to ecosystems (e.g. damage to flora and fauna)	Occurrence of infringement of labour rights	Unsafe use of equipment	No rules, standards, or procedures	Spillage of waste in natural systems	No rules, standards, or procedures	Unmonitored facility/ site	Improper motivation or attitude	Unsafe use of equipment	No rules, standards, or
Minor environmental	Fire or Explosion	Odour air Emissions	Occurrence of infringement of human rights	Improper Positioning/ Storage	Lack of knowledge or skills	Improper handling of wastewater, effluent	Lack of knowledge or skills	No local employment generation	Failure to comply with rules	Improper Positioning/ Storage	Lack of knowledge or skills
Minor injury/illness	Trips & smaller falls	Dust, Fumes, Vapours, Air pollution	Stakeholder/community complaint	Unsafe Loading or positioning	Improper motivation or attitude	Failure to follow MSDS instructions	Improper motivation or attitude	Operating in a culturally significant area	Other	Unsafe Loading or positioning	Improper motivation or attitude
Minor property damage	Drowning	Other (please specify below)	Strike, demonstration	Horseplay or teasing	Failure to comply with rules	No protection of local fauna	Failure to comply with rules	Operating in densely populated area		Horseplay or teasing	Failure to comply with rules
Near Miss	Borrow-pit Mgmt	Other (please specify below)	Other (please specify below)	Alcohol or Drugs	Other	No provisions for noise nuisances	Other	Operating in conflict area		Alcohol or Drugs	Improper Planning
	Dust, Fumes, Vapours			Lifting or Carrying		No provisions against air pollution		Presence of indigenous people		Lifting or Carrying	Poor Maintenance
Class 1 - Fatal	Noise			Failure to use PPE		Using excessive amounts of resources		No grievance mechanism in place		Failure to use PPE	Poor Supervision
Class 1 - Lost-time	Temperature or heat			Incorrect use of tools or equipment		Pollution of surface groundwater		Other		Incorrect use of tools or equipment	Poor Quality of Equipment
Class 1 - Major environmental	Overexertion			Alcohol or drug abuse		Forest harvesting				Alcohol or drug abuse	No rules, standards, or procedures
Class 1 - Major property damage	Structural Failure			Taking shortcuts		Acquisition/conversion of significant land area				Taking shortcuts	Lack of knowledge or skills
Class 1 - Reportable social	Chemical/biological			Inadequate guards		Poor ventilation				Inadequate guards	Improper motivation or attitude
Class 2 - Minor environmental	Stress			Poor Visibility		No permit system in place				Poor Visibility	Failure to comply with rules
Class 2 - Minor injury/illness	Violence, aggressions			Defective Tools or Equipment		Presence of asbestos				Defective Tools or Equipment	Other
Class 2 - Minor property damage	Other (please specify below)			Dangerous Work arrangement		Operating in/close to protected areas				Dangerous Work arrangement	
Class 2- Near Miss				Poor ventilation		Operating in/close to coastal/river sides				Poor ventilation	
				Protection Equipment		Operating in area prone to natural				Protection Equipment	
				Poor housekeeping		Presence of landmines				Poor housekeeping	
				Tripping/slipping hazard		Other				Tripping/slipping hazard	
				Normal Wear and Tear						Normal Wear and Tear	
				Poor Weather Conditions						Poor Weather Conditions	
				Other						No waste segregation	
										Unsafe management of	
										Burning of waste	
										No use of spill kits/	
										Spillage of waste in natural	
										Improper handling of	
										Failure to follow MSDS	
										No protection of local fauna	
										No provisions for noise	
										No provisions against air	
										Using excessive amounts of	
										Pollution of surface	
										Forest harvesting	
										Acquisition/conversion of	
										Poor ventilation	
										No permit system in place	
										Presence of asbestos	
										Operating in/close to	
										Operating in/close to	
										Operating in area prone to	
										Presence of landmines	
										Other	

HSSE Reportable Incidents and Incident Examples

1. Introduction

UNOPS is committed to maintaining systems for the identification, reporting and investigation of all Occupational Incidents. Proper notification and investigation of Occupational Incidents is essential to ensure that the root causes are identified and similar incidents do not recur in the future.

The purpose of this guideline is to assist UNOPS facilities and operations with the classification, identification, reporting and investigation of occupational incidents. The guideline also highlights examples of HSSE reportable and non-reportable incidents as well as incidents that should be handed over to different units within the organisation.

2. Incident Management

For the purposes of HSSE management in UNOPS, work locations, premises or sites include UNOPS offices, storage facilities, project sites and sites or premises directly associated with projects.

All UNOPS Personnel and Contractors are required to report **occupational incidents** in accordance with the **EOI.SSC.2021.01 on Health & Safety and Social & Environment Management** ([EN](#) - [FR](#) - [ES](#)).

The EOI highlights the type of incidents that must be reported and investigated:

- **Class 1 incidents (Major incidents)** - e.g. fatality or 7 or more days off work (for health & safety); considerable international and/or national reputational risk for UNOPS (for social), and/or extending beyond the project boundaries and lifespan (for environment).
- **Class 2 incidents (Minor incidents)** - e.g. anything else that is not covered above, including near-misses.

3. What is a reportable Occupational Incident?

A reportable health and safety occupational incident under these two categories is as follows:

Occupational Injury: An occupational injury is a physical harm that results from a work-related event or from a single instantaneous exposure in the work environment e.g. falling from height while working on a scaffold, hand being caught in rotating part of construction equipment or electrical shock on site.

Occupational illness: An occupational illness is a state of being unwell or any abnormal condition or disorder caused by factors related to a person's work e.g. any disease contracted as a result of an exposure to risk factors arising from work activity

3.1 What is not categorised as occupational incidents?

- **Pre-existing conditions**

A pre-existing condition is a medical condition that you have before starting your job (e.g. asthma, allergies or diabetes).

- **Conditions contracted outside the work setting**

If you injure yourself outside of your work setting, it is not categorized as an occupational incident e.g. a fall, resulting in a broken bone, on your way to work but outside work premises.

4. Examples of occupational reportable incidents

4.1 Reportable Class 1 incidents

- **Fatal incidents**

All fatalities to workers and non-workers must be reported if they arise from an occupational incident, including interaction with equipment structures or other personnel. Fatalities such as suicides are not HSSE reportable incidents, as the death does not result from a work-related incident. Security incidents such as attacks on workers by armed groups are not included.

- **Lost-time injuries**

All injuries that prevent personnel and contractors from conducting their normal work for at least seven (7) days or more are reportable occupational incidents. Examples include, but are not limited to:

- Injuries caused by the collapse of the ground from excavation
- Injuries caused by a fall from a height
- Serious Burns
- Crush injuries
- Fractures
- Amputation of an arm, hand, finger, or leg
- Injuries arising from working in an enclosed space, which leads to hypothermia

- **Major environmental incident**

Incidents causing major environmental problems such as excessive spill occurrences and excessive disturbance to native wildlife and plant species.

- **Major property damage incident**

An incident resulting in damage to property where the cost of the damage is equal to or above \$20,000.

- **Reportable social issue/incident**

Excessive damage to heritage sites or important community sites and any adverse impacts on the community.

4.2 Reportable Class 2 incidents

- **Minor environmental incident**

Any localised environmental impact that does not lead to greater impacts outside of the operations area and may be corrected relatively easily within UNOPS operations area.

- **Minor injury/illness**

Incidents that require immediate attention and results in a person not being able to perform his/her duties for less than seven (7) days; and does not lead to significant reduction in quality of life of the affected person e.g. first-aid injuries such as lacerations and cuts, bruises, minor dislocations, minor burns and scalds.

- **Minor property damage**

Incident with the cost of damage amounting to less than \$20 000.

- **Minor social issue/incident**

A minor issue or incident arising from interaction with the public, community and/or other stakeholders, that has limited negative impacts on society and beneficiaries, but needs to be recorded and monitored to avoid escalation.

- **Near miss**

Incidents with the potential to cause harm;

- **High Potential near miss:** The rating applied to an incident which could have resulted in a fatality, serious incident, major environmental/social incidents or major property damage i.e. plant or equipment coming into contact with overhead power lines, excavation ground collapse, failure of load-bearing parts of lifts and lifting equipment
- **Low potential near miss:** An event which would have caused an incident resulting in minor harm to people, property or the Environment e.g. slipping (but not falling) due to bad housekeeping or a small tool/material falling from height, not hitting anyone.

4.3 Reportable Safety Observations

- **Unsafe act**

Behaving or performing an activity in a way that is unsafe, i.e., in a way that could cause harm or in a way that is contrary to HS norms, and requirements and could result in an incident happening if left unaddressed (e.g. working without proper authorization, working without following the standard operating procedures, or failing to wear proper personal protective equipment).

- **Unsafe condition**

A state in which the workplace, equipment, machinery, tools or structures are unsafe and could result in harm (e.g. faulty equipment or slippery floors).

4.4. Reportable Occupational Illnesses and Diseases

Illnesses and diseases resulting from exposure to environmental factors associated with work. Occupational diseases are reportable if the disease or illness was contracted as a result of exposure to occupational health hazards or risk factors arising from a work task or activity. Examples of reportable occupational diseases and illnesses and associated health hazards include:

- Diseases caused by chemical hazards (these hazards are found in the form of solids, liquids, gasses, mists, dust, fumes, and vapours) i.e. diseases caused by mercury or its compounds.

- Diseases caused by physical hazards (noise, illumination, temperature, ionizing and non-ionizing radiation) i.e. hand-arm vibration syndrome.
- Diseases attributed to exposure to biological agents (these hazards include bacteria, viruses, fungi)
- Illnesses arising from exposure to ergonomic hazards and occupational musculoskeletal disorders i.e. carpal tunnel syndrome due to extended periods of repetitive movements
- Occupational cancer i.e. cancer caused by crystalline silica, occupational asthma and occupational dermatitis

5. Classification of incidents as UNOPS or Non-UNOPS

The classification of whether an incident is a UNOPS incident or not is determined based on the **managerial control** of the site and operations. If UNOPS has direct control over the site and operations then the incident will be a reportable UNOPS incident. For sites and operations where UNOPS only has influence, however, the incident might be reportable but will not be recorded as an HSSE incident.

Examples of UNOPS incidents

- Incidents at sites or premises directly associated with projects such as warehouses, borrow pits, quarries and waste management facilities that are being used exclusively to support UNOPS work
- Incidents at UNOPS accommodation and in places where UNOPS provides accommodation
- Incidents that occur during the execution of a UNOPS work activity
- UNOPS directly managed personnel/ partner personnel with UNOPS contracts
- Incidents that occur involving contractors at UNOPS sites or premises whose activities are directly contributing to UNOPS projects or offices

Examples of Non UNOPS incidents

- Incidents at sites or premises where UNOPS does not have direct control of the site and operations
- Occurrences at private accommodation
- Occurrence during travel from home to normal place of work
- Deviation from normal route for non-official purposes while using site mobile equipment (e.g. excavators and loaders or ordinary vehicles)

5.1 Classification of UNOPS and Non-UNOPS incidents on a case by case basis

A case by case determination of whether the incident is a UNOPS incident or non-UNOPS incident shall be made depending on the circumstances surrounding the incident and the incident investigation process. Some case by case would include;

- If the associated sites or facilities are not exclusively for UNOPS but are shared with other users
- In instances where incidents occur at associated facilities (third party facilities or operations) that could not be reasonably expected to be under UNOPS control
- Incidents that have occurred outside the stipulated work hours without prior authorisation to site access
- Instances where it is clear that an incident occurred due to failure to adhere to laid down safety measures and procedures and where the health and safety rules have been ignored
- Contractor operations that are not exclusive to UNOPS
- Incidents involving non-UNOPS personnel or Contractors at UNOPS sites and premises

6. Security vs. HSSE incidents

- Road traffic Accidents on official duty for UNOPS personnel and contractors are both reportable incidents although reported through different channels.
- RTA involving UNOPS personnel is categorised as a security incident and not an HSSE incident therefore all RTAs involving UNOPS personnel should be reported under the Security Management System (SMS)
- RTA involving UNOPS contractors is categorised an HSSE incident and should be reported to HSSE and follow the HSSE requirements on Incident Investigation

** Road safety is currently listed under mandatory UN security policies and instructions that are applied across the UN through UNDSS. They only apply to UN personnel, not contractor operations. To avoid double reporting, offices/personnel UNOPS personnel related RTAs should only be reported to Security. However, UNDSS and UN security activities do not extend to contractor activities and project sites therefore, project/contractor incidents are reported to and managed by HSSE.*




Health, Safety, Social and Environmental (HSSE) Internal review (audit) - HSE16

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Reviewer	
Location being reviewed	
Area Representative	
Date	

[illegible]

 <div>UNOPS Operational excellence for results that matter</div>				Health, Safety, Social and Environmental (HSSE) Internal review (audit) - HSE16									
				© UNOPS 2020, v 2.0									
				Reviewer									
				Location being reviewed									
				Area Representative									
Date													
Clause		Description	Requirements	Findings	Significance: Major Non-conformity / Minor Non-conformity / Observation	Root Cause Analysis	Corrective Action Required	By Whom	By When	Progress	Supporting Evidence	Relevant templates	
9.3	9.3	Management review	Review of performance, communication, previous audits,									HSE15	
10.1,	10.1,	Continous improvement	Evidence of continous improvement of the system.										

NOTES:

Clauses in red are to be audited at HQ location only.

The following should be considered when planning the internal review:

- the size of operations
- the criticalities highlighted in previous audits/reviews
- the environmental importance of the processes carried out at the location
- the health and safety risks of the processes carried out at the location
- any changes affecting the local processes

«УТВЕРЖДАЮ»
Директор
ООО «Kovcheg-Art»
_____ **Матраимов Б. И.**

***Проект заявления о воздействии на
окружающую среду (ЗВОС)
на реконструкцию существующего двухэтажного здания
лаборатории и строительства дополнительного здания с
локальной котельной в Алмазарском районе
Управления Санитарно-Эпидемиологического Благополучия и
Общественного Здоровья г. Ташкента***

Проект разработан
ООО «Sertika Produktion»

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Ташкент
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Введение

Настоящий Проект ЗВОС разработан с целью оценки воздействия на окружающую среду для строительства и реконструкции двухэтажного здания лабораторий Управления санитарно-эпидемиологического благополучия в г. Ташкент с организацией офисных и лабораторных помещений.

В настоящее время на данной территории расположено здание, используемое в качестве АБК и помещений с установленным лабораторным оборудованием.

Управление санитарно-эпидемиологического благополучия г. Ташкент специализируется на осуществлении Санитарно-эпидемиологического контроля (санитарно-эпидемиологический государственный надзор) – деятельность по предупреждению, обнаружению, пресечению нарушений в области обеспечения санитарно-эпидемиологического благополучия населения в целях охраны здоровья населения и среды обитания человека.

В основу документа положены материалы рабочего проекта, включающие сведения о технологии строительных работ, данные по расходу сырьевых материалов и конечной продукции, а также сведения о режиме работы предприятия.

Генеральным подрядчиком объекта является ООО «Kovcheg-Art».

Оплату государственной экспертизы будет производить также ООО «Kovcheg-Art».

Проект ЗВОС выполнен в соответствии с законодательными, руководящими и нормативными документами, имеющими действие на территории Республики Узбекистан, в том числе:

- Законом Республики Узбекистан «Об охране природы»;
- Законом Республики Узбекистан «Об охране атмосферного воздуха»;
- Законом Республики Узбекистан «О воде и водопользовании»;
- Санитарными нормами и правилами по охране атмосферного воздуха населенных мест Республики Узбекистан СанПиН № 006-93, Ташкент, 1993 г.;
- Перечнем предельно допустимых концентраций (ПДК) загрязняющих веществ в атмосферном воздухе населенных мест на территории Республики Узбекистан, утвержденным Минздравом Республики Узбекистан.

Проект ЗВОС выполнен в соответствии с требованиями Закона «Об экологической экспертизе» и Постановления Кабинета Министров Республики Узбекистан №541 от 07.09.2020 г. Предприятие относится к III категории экологической опасности (пункт 58).

1. Состояние окружающей среды в зоне влияния предприятия
1.1 Краткая характеристика физико-географических, климатических условий
и экологической ситуации района

Юридический адрес Управления санитарно-эпидемического благополучия г. Ташкент: г. Ташкент, Алмазарский район, МФЙ Тараккиёт, ул. Карасарай 341.

Географические координаты границ объекта: 41.357297, 69.242276, 41.356772, 69.242244, 41.356739, 69.240115, 41.357786, 69.240104, 41.357786, 69.240694, 41.357342, 69.240774.

Данному району свойственна основная часть физико-географических и климатических особенностей Ташкентского оазиса, территория которого размещается в предгорьях Западного Тянь-Шаня в среднем течении р. Чирчик, на правобережной террасе.

Климат г. Ташкента характеризуется резкой континентальностью и засушливостью с большой амплитудой сезонных и суточных колебаний температур. Количество осадков – незначительное, в основном они выпадают в зимне-весенний период. Близость гор определяет своеобразие циркуляции атмосферного воздуха. В районе преобладают ветры восточного и северо-восточного направлений.

Климатическая характеристика города Ташкента представлена в Таблице 1.

Среднегодовая температура воздуха равна +13,4°C, средняя температура самого жаркого месяца – июля – +35,2°C, средняя температура самого холодного месяца – января - -2,3°C. Абсолютный максимум наблюдается в июле - +41,8°C, абсолютный минимум – в январе - -15°C. Наиболее резкое повышение температуры отмечается в апреле, а, начиная с августа, происходит резкое ее понижение. Для Ташкента характерны резкие отклонения температуры воздуха от нормы, особенно в холодное полугодие.

Особенности орографии местности обуславливают наличие горно-долинной циркуляции воздуха, проявляющейся в периодической внутрисуточной смене направлений. В ночные часы преобладают ветры, дующие со склонов, днем – дующие вверх по долине.

Для Ташкента характерны ветры с небольшими значениями скоростей (от 1,4 до 1,6 м/с). Чаще всего отмечаются слабые (0 - 1 м/с) ветры, их повторяемость за год составляет 62,3%, достигая максимума в октябре и ноябре (72%). Такие ветры способствуют накоплению в атмосферном воздухе загрязняющих веществ, поступающих от низких неорганизованных источников выбросов.

Ветер, с несколько большей скоростью, служит очищающим фактором. Среднегодовая повторяемость ветра со скоростью 2 - 3 м/с – 36 %. Наиболее часты такие ветры в апреле (47,8%) и марте (45,2%). Ветер со скоростью 4 - 7 м/с способствует накоплению примесей от высоких и горячих источников. К ним относятся источники выбросов энергетических объектов (ТашТЭЦ, ТЦ, промышленные котельные). Повторяемость таких ветров невелика $\approx 2\%$.

Климатические данные по метеостанции Ташкент

Климатические параметры	1988-2017	2003-2017
Средняя максимальная температура наиболее жаркого месяца	35.7	35.4
Средняя минимальная температура самого холодного месяца	-1.6	-1.3
Средняя годовая температура, °С	14.7	15
Годовая сумма осадков, мм	441.7	467.5
Среднегодовая скорость ветра, м/с	1.9	1.2
Скорость ветра, 5%	3.3	

Наименование	Величина
1	2
Коэффициент, зависящий от стратификации атмосферы, А	200
Коэффициент рельефа местности в городе	1.0
Средняя максимальная температура наружного воздуха наиболее жаркого месяца года, °С	+35.7
Средняя температура наружного воздуха наиболее холодного месяца года (для котельных, работающих по отопительному графику), °С	-1.6
Среднегодовая роза ветров, %	
-С	12
-СВ	9
-В	29
-ЮВ	8
-Ю	12
-ЮЗ	4
-З	17
-СЗ	9
Среднегодовая скорость ветра, м/с	1.9
Скорость ветра (по средним многолетним данным) повторяемость превышения которой составляет 5%, м/сек	3,3

Среднегодовая относительная влажность воздуха невелика – 58 %. В годовом ходе наибольшее среднемесячное значение относительной влажности отмечается в декабре и январе (73-74 %), весной ее значения уменьшаются, и летом наблюдается минимум (40-44 %). В первой половине осени относительная влажность имеет более низкие значения, по сравнению с весной.

Среднегодовое количество осадков – 557,3 мм. В годовом ходе минимум наблюдается летом. Максимум приходится на апрель и декабрь (97,2 и 84,2 мм). В Ташкенте, в период с октября по апрель преобладают осадки обложного характера, в апреле и, особенно, мае, наблюдаются осадки ливневого характера, сопровождающиеся грозами. Среднегодовая облачность составляет 4,6 балла.

К неблагоприятным атмосферным условиям относятся туманы и пыльные бури.

Туманы в Ташкенте наблюдаются, в основном, при адвекции холода в антициклонических условиях, чаще всего в зимние месяцы. Среднегодовое число дней с туманами равно 33, наибольшее число туманных дней отмечается в декабре (10). В суточном ходе туманы наблюдаются, в основном, в вечерние, ночные и утренние часы.

Пыльные бури в Ташкенте достаточно редки – среднегодовое число дней с пыльными бурями равно 5, средняя продолжительность – менее 1 часа. Чаще всего пыльные бури возникают при северных и северо-западных ветрах со скоростью 2 - 5 м/с.

Город Ташкент относится к зоне с высоким потенциалом загрязнения атмосферы – ПЗА = 3,2. К высокому ПЗА приводит застойное состояние воздуха, возникающее при сочетании слабых ветров (0 – 1 м/с) с приземными инверсиями. Такое состояние атмосферы способствует накоплению примесей от низких источников. В Ташкенте приземные инверсии фиксируются в течение всего года на уровне 40-60 %, преимущественно в ночные и утренние часы, соответственно и повторяемость застойных ситуаций в это время наибольшая (52 %).

Фоновые концентрации в атмосферном воздухе, по наблюдениям Главгидромета: пыль 0.1 (0.3) мг/м; диоксид азота 0.06 (0.3) мг/м в основном формируются промышленными предприятиями и автомобильным транспортом.

Таким образом, анализ физико-географических и климатических особенностей района расположения предприятия показывает, что наибольшая вероятность высоких уровней загрязнения атмосферы и, как следствие, почвы и растительности, существует для низких, неорганизованных выбросов, осуществляющих наибольший вклад в приземный жизнедеятельный слой атмосферы. Для рассеивания высоких горячих выбросов условия благоприятные.

Предлагаемая технология не предусматривает возникновение низких или неорганизованных источников выброса, следовательно, можно предположить, что существенного прессинга не предвидится.

1.2 Поверхностные воды

Поверхностных водотоков, наиболее близко расположенных к территории предприятия не имеется. На расстоянии 510 м к северу от границ объекта протекает к. Каракамыш. Объект прямого воздействия на данный водоток не оказывает.

1.3 Подземные воды

Подземные воды района подразделяются на межпластовые воды третичных отложений и грунтовые воды четвертичных образований. Подземные воды неогеновых отложений, приуроченных к конгломератной части толщи и залегают на глубине свыше 1000 м.

Грунтовые воды четвертичных отложений приурочены, в основном, к гравийно-галечниковому слою, а водоупором являются каменные лессы. Расчетный максимум зеркала грунтовых вод равен 3,9 м, колебания уровня грунтовых вод – 1,4 м. Коэффициент фильтрации составляет 54 м/сут.

Формирование грунтовых вод верхнечетвертичных отложений происходит за счет подземного притока с гор, а также за счет инфильтрации поверхностных вод ирригационных каналов и малых оросителей. Общее направление потока грунтовых вод совпадает с уклоном местности, т.е. на запад-юго-запад.

В связи с расположением выше по потоку большого количества промышленных предприятий, основным из которых является ТАПОиЧ, грунтовые воды несут большое количество токсичных элементов, химических веществ и нефтепродуктов.

Грунтовые воды района мало минерализованы. Содержание сухого остатка водорастворимых солей – 340 мг/л, общая жесткость – 8 мг-экв/л. По гидрохимическому составу воды гидрокарбонатно-сульфатно-магниевые, слабощелочные. Содержание гидрокарбонатов – 157,1 мг/л, сульфатов-ионов – 51,84 мг/л, ионов магния – 51,1 мг/л, ионов кальция – 38,1 мг/л, ионов натрия и калия – 26,15 мг/л, ионов хлора – 16,8 мг/л.

Грунтовые воды не агрессивны к обычным бетонам на несulfатостойких цементах.

1.4 Почвы и грунты

Район расположения предприятия приурочен к III надпойменной правобережной террасе реки Чирчик, сложенной раннесырдарьинским комплексом отложений. Они представлены лессовыми породами среднечетвертичного и верхнечетвертичного возраста, подстилающиеся галечниками и конгломератами большой мощности.

Верхние слои грунтов, слагающие участок, не засолены, находятся под интенсивным влиянием выбросов вредных веществ в атмосферу предприятий г.г. Ташкента и Чирчика.

В состав загрязняющих компонентов входят оксиды азота, серы и углерода, аммиак. Большое количество пыли, содержащей токсичные металлы, аэрозоли.

Вредные примеси из атмосферы поступают в почву орошаемых светлых сероземов, староорошаемых лугово-сероземных почв.

В просматриваемом районе типичный профиль сероземов нарушен, преобладают перемещенные массивы почвогрунтов в результате интенсивного строительства. Наряду с инженерными сооружениями на почву оказывается и агротехническое воздействие на небольших приусадебных участках, в придорожных посадках, в зеленых массивах внутри жилых застроек. Содержание гумуса в почвах под посадками – 2,5 %, на открытых пространствах – 1,8 %.

В составе карбонатов в сероземах преобладает карбонат кальция. В почвенных горизонтах по мере приближения к дневной поверхности наблюдается нарастание поглощенного калия и кальция. Валовое содержание калия и фосфора от места к месту меняется незначительно, содержание кальция – постоянно. Фосфор преобладает в почвах приусадебных участков. В целом ощущается недостаток магния и калия. Общее содержание азота в сероземах также невелико. Концентрация азота нитритного, нитратного и аммонийного в среднем составляет 0,004, 0,006 и 0,043 г/кг соответственно. Среднее содержание сульфатов 0,332 г/кг. Концентрации микроэлементов варьируют слабо и значительных превышений над местными фоновыми значениями не обнаруживается. Загрязнение нефтепродуктами составляет около 0,024 г/кг, что характерно для всего города.

Состояние почв в районе предприятия следует признать удовлетворительным.

1.5 Растительный и животный мир

Ташкентский оазис практически полностью поменял естественный ландшафт на культурный. Древесная растительность г. Ташкента представлена,

наряду с аборигенными видами растительности, также акклиматизированными видами из других регионов.

Очень характерны для условий г. Ташкента тополь, карагач, чинара, ясень, клен. Из иноземных видов обычны глядичея, айлант, софора, мимоза, туя.

В Ташкенте повсеместно получили распространение посадки различных деревьев вдоль дороги – платан. Тополь, айлант высочайший, ясень, клены, софора, реже туя.

Учитывая специфику выбросов расположенных вблизи к предприятию автомагистралей, можно рассматривать загрязняющиеся участки растительности как агроценозы, получающие дополнительное количество минеральных удобрений в виде нитратов.

Древесная растительность района находится в удовлетворительном состоянии. Габитус растений, их высота, форма кроны соответствуют их норме. Этому способствует полив растений, проводимый в данном районе.

Исследования состояния листовой пластинки древесной растительности, степени поражения листьев не проводили, учитывая зимний сезон проведения работы.

Непосредственно на рассматриваемом участке имеются многочисленные упорядоченные посадки деревьев различных пород. В период проведения строительных работ вырубка деревьев производится не будет.

В связи с тем, что организуемый объект находится в густонаселенном районе г. Ташкента, биоразнообразие животных здесь минимально и фауна представлена, в основном, грызунами (полевка, домовая мышь, серая крыса), городской орнитофауной (грач, галка, серая ворона, скворцы, различные виды воробьев, майна, голуби и т.д.), домашними животными подворий (крупный и мелкий рогатый скот, птица).

Древесные насаждения, растущие на территории вырубке не подлежат.

Согласно акта обследования Управления по экологии, охране окружающей среды и изменения климата г. Ташкента рекомендовано перенос древесных насаждений в количестве 27 ед. Разрешение №43952765 от 01.03.2024 г.

2. Существующие источники загрязнения окружающей среды района размещения объекта

Крупными источниками воздействия на окружающую среду Алмазарского района являются Автотранспортные предприятия, автозаправочные станции, Теплоцентраль и большое количество малых предприятий производственного профиля.

В выбросах этих предприятий содержатся пыль, оксиды азота и углерода, углеводороды, диоксид серы.

Кроме того, источником загрязнения является автотранспорт, который является крупнейшим источником загрязнения атмосферного воздуха, как района, так и всего города. В отработанных газах двигателей внутреннего сгорания содержится свыше 200 токсичных компонентов, из них 160 – это производные углеводородов, образующиеся вследствие неполного сгорания топлива.

К наиболее напряженным магистралям относятся Ташкентская кольцевая автомобильная дорога.

К естественным источникам загрязнения атмосферы, почвы и растительности следует отнести при повышенных скоростях ветра сухую подстилающую поверхность.

3. Характеристика предприятия – источника воздействия на окружающую среду

3.1 Общие сведения об объекте

Юридический адрес УСЭБиОЗ г. Ташкента: г. Ташкент, Алмазарский район, улица Карасарай 341.

Рассматриваемая территория строительства размещается в по этому же адресу и граничит:

- с севера – Центр вакцинации, далее Магазин Строй мир
 - с востока – ул. Карасарай, за которой предприятие Маселко;
 - с юга и запада – с предприятием по производству картонных коробок;
- Жилые дома находятся на расстоянии более 30-40 м к югу от границ объекта.

Общая площадь 24892 м².

Старые застройки - 6560 м²

новое строение - 1151,2 м²

самовольные застройки - 1754 м²

усовершенствованные покрытия - 3526.8 м²

грунтовые покрытия - 11900 м²

Лаборатория УСЭБиОЗ г. Ташкента проводит следующие виды исследований:

бактериологические:

- диагностика холеры от людей и из объектов внешней среды.
- диагностика сибирской язвы от больных и объектов внешней среды;
- диагностика бруцеллёза от людей;

серологические:

- диагностика бруцеллёза от людей и молочные продукты;
- диагностика риккетсиозов; сипной тиф, лихорадка Ку.

Количество сотрудников предприятия составляет 16 человек, из них АУП -5; Испытательный центр- 6; ПЦР-1; БАК-4. Ориентировочный штат лабораторного корпуса составляет - 38 человек.

Режим работы предприятия – 8 часов в сутки, 330 дней в году.

Лабораторный корпус

Технологические решения.

Общая часть

Технологическая часть проекта "Служба санитарно-эпидемиологического благополучия и здравоохранения города Ташкента" разработана на основании задания на проектирование.

При проектировании были использованы следующие документы:

- СанПиН № 0220-22
- Санитарно-эпидемиологические станции. КМК 2.08.06-97

- СН по проектированию 535 81 санитарно-эпидемиологических станций
- СанПиН 3.3686-21 "Санитарно-эпидемиологические требования по профилактике инфекционных болезней"

- Правила биологической безопасности при работе с патогенными биологическими агентами I-II групп опасности

Структура санитарно-эпидемиологического корпуса

- Лаборатория особо опасных инфекций

- Вирусологическая лаборатория

- Бактериологическая лаборатория

Лабораторный корпус двух этажный без подвала.

Поэтажное распределение лабораторий, их характеристика

1 этаж - лаборатория особо опасных инфекций и часть вирусологической лаборатории

2 этаж - бактериологическая лаборатория и часть вирусологической лаборатории.

При перепланировке здания учитывалось разделение потоков поступления образцов для анализов, вход для персонала лаборатории и посетителей.

Характеристика помещений

Функционально помещения делятся на две зоны: чистую и грязную. На границе зон предусмотрены санитарные пропускники раздельные: для женщин и для мужчин. Также на границе зон в коридоре установлен аварийный душ. Двери лабораторий оснащены электронными замками. При входе в помещения с повышенными требованиями предусмотрены воздушные шлюзы (пред боксы).

Лаборатория особо опасных инфекций

Лаборатория особо опасных инфекций предназначена для диагностики таких инфекций как: холера, сибирская язва, бруцеллёз.

Вход персонала расположен со стороны внутреннего двора. При входе в чистую зону расположены раздельные гардеробные для мужчин и женщин, далее идут кабинеты заведующего и врачей, комната отдыха персонала, моечная со стерилизационной, чистый автоклав, средоварная с местом для разлива сред, склад, санитарный узел и помещение уборочного инвентаря.

В грязной зоне лаборатории со стороны двора предусмотрены подходы посетителей к окнам для раздельного приема образцов на анализы, таких как: бруцеллёз и сибирская язва, холера 1 от людей, холера 1 из окружающей среды, холера 2, кровь на бруцеллёз в серологию. Из приемной образцы поступают в препараторские и далее в исследовательские. Такие помещения как исследовательские бактериологии холеры, бруцеллёза, сибирской язвы и помещение биологического отбора проб оснащены пред боксами (воздушные шлюзы).

За счет увеличения площади лабораторного корпуса был добавлен ПЦР блок, состоящий из трех помещений: помещения приготовления реакционных смесей, комната выделения РНК, ДНК и амплификационная. Так же добавлено помещение для хранения эталонных штампов.

Весь отработанный материал после проведения анализов поступает на обеззараживание в грязный автоклав, а в помещении для отбора проб в целях

предотвращения опасности заражения предусмотрена газовая плита для термической обработки (обеззараживания) отходов сибирской язвы.

Вирусологическая лаборатория

Вирусологическая лаборатория предназначена для проведения диагностических исследований вирусных инфекций, контроля состояния противовирусной иммунной системы, понимания механизмов распространения вирусов и профилактических мероприятий в борьбе с вирусной инфекцией.

Лаборатория расположена в двух уровнях. Входы персонала, посетителей и приема образцов отдельные.

На первом этаже чистая зона лаборатории, санитарные пропускники, а за их пределами в грязной зоне расположено помещение приема проб на анализы из лечебных учреждений, также для посетителей предусмотрено помещение взятия проб крови на анализы и санитарный узел для инвалидов. Пробы на анализы поднимают сотрудники лаборатории на лифте.

Чистая зона представлена двумя гардеробными для мужчин и женщин, кабинетами заведующего и врачей, складом, санитарным узлом. За пределами лаборатории на данном этаже для всех лабораторий запроектирована кухня-столовая и технические помещения.

На втором этаже расположились две группы ПЦР помещений: одна для исследования крови, вторая для исследования продуктов на наличие в них ГМО. Благодаря увеличению площади лабораторного корпуса помимо помещений пробоподготовки и серологических исследований добавлены два помещения культуры клетки. Все помещения ПЦР и культуры клетки оснащены воздушными шлюзами. Также на этаже расположены грязный автоклав, помещение для мытья и стерилизации стеклянной посуды, чистый автоклав.

Бактериологическая лаборатория

Бактериологическая лаборатория выполняет диагностическую работу для лечебных учреждений, не имеющих своей лаборатории, проводит профилактическое обследование населения и санитарно-бактериологическое исследование пищевых продуктов.

Лаборатория расположена на втором этаже лабораторного корпуса, вход персонала расположен со стороны внутреннего двора. Персонал поднимается на второй этаж по лестнице и входит в чистую зону лаборатории. Соответственно сначала попадают в гардеробные персонала (для мужчин и для женщин). Далее подобно лаборатории ООИ расположены кабинеты заведующего и врачей, комната персонала, средоварка с местом для разлива сред, чистый автоклав, моечная со стерилизационной, санитарный узел.

Поступление проб на анализы в грязную зону осуществляется со стороны двора при помощи лифта. Имеются помещения для отдельного приема проб на кишечную группу и проб на продукты. Лаборатория представлена такими помещениями как: препараторские, исследовательские на кишечную, респираторную инфекции, бактериологический анализ, серологический кабинет, ПЦЗ комнаты: приготовление реакционной смеси, выделение РНК, ДНК, амплификационная, помещение для хранения эталонных штаммов, камера биологического анализа с моечной, грязный автоклав. Помещения с высокими требованиями оснащены воздушными шлюзами.

Оснащение оборудованием

Все помещения и кабинеты оснащены приборами и оборудованием необходимым для выполнения лабораторных работ. Вновь устанавливается существующее оборудование, прошедшее инвентаризацию и признанное пригодным для работы. Несколько единиц оборудования закуплено UNOPS и предполагается в перспективе дооснастить оборудованием некоторые помещения.

Перечень инженерного оснащения

Лабораторный корпус оборудуется следующими инженерными устройствами:

- центральным отоплением;
- приточно-вытяжной вентиляцией;
- водопроводом холодной и горячей воды;
- канализацией;
- электроэнергией для осветительных и силовых нужд;
- телефонизацией.

4. Источники воздействия, как элементы основной и вспомогательной технологии, функционирование которых является причиной изменения окружающей среды

Предприятие будет являться источником загрязнения атмосферного воздуха, образования коммунально-бытовых сточных вод, отходов производства и потребления.

В процессе своей деятельности предприятие не будет использовать химические реактивы и кислоты. Для проведения испытаний используются только питательные среды. Выброс загрязняющих веществ при проведении лабораторных испытаний отсутствует. Предприятие будет являться источником загрязнения атмосферного воздуха, образования коммунально-бытовых сточных вод, отходов производства и потребления.

Загрязнение атмосферного воздуха будет происходить от бытового отопительного оборудования.

Водоснабжение на рассматриваемой территории решено из централизованного горводопровода на основании заключаемых ежегодно договоров с трестом «Сувсоз».

Водоотведение хоз-бытовых сточных вод производится в горканализацию.

Сточные воды из лабораторий направляются в Хлораторную и после обеззараживания сбрасываются в горканализацию.

В процессе деятельности предприятия происходит образование следующих видов отходов:

- отработанные светодиодные лампы
- отработанные бактерицидные люминесцентные лампы
- макулатура;
- отходы отработанных образцов;
- коммунально-бытовые отходы.

Все отходы являются деловыми и подлежат вывозу и утилизации на сторонних предприятиях.

Получено Техническое условие на газоснабжение природным газом от № **055904** от 23 февраля 2024 г и № **057218** от 5 марта 2024г. выданные ГТФ "HUDUDGAZ POYTAXT;

4.1 Анализ воздействия на атмосферный воздух
4.1.1 Характеристика предприятия, как источника загрязнения
атмосферного воздуха

В процессе проведения испытаний выделений в атмосферный воздух не происходит, из-за незначительного количества расходуемых химреактивов (всего около 12-15 кг в год различных наименований).

В помещении котельных установлены газовые котлы:

Отопительный котел "МТУ 750 Квт"	- 72,15 м ³ /ч - 1 шт
Отопительный котел 60 Квт	- 6,5 м ³ /ч - 1 шт
Отопительный котел "Ferrolі"	- 10 м ³ /ч - 1 шт
Отопительный котел "Viessman Vitoplex 200" 150 Квт	- 14,3 м ³ /ч - 3 шт
Водогрейный котел "Slime"	- 5,37 м ³ /ч - 1 шт
Водогрейный котел "Аристон"	- 0,89 м ³ /ч - 1 шт

В кухонных помещениях для приготовления сред установлены черыхкомфорочные газовые плиты - 1,12 м³/ч - 7 шт

В процессе работы котлов и газовых плит выделяются углерода оксид, азота диоксид, сернистый ангидрид.

Выбросы загрязняющих веществ будут происходить организованно через отдельную трубу (источник №1-15).

Объект также будет обеспечивать аварийное электроснабжение, для чего будет предусмотрен дизель-генератор мощностью 40 кВА, который будет питать специальные потребители по униполярным схемам.

В процессе работы дизель-генератора выделяются углерода оксид, азота диоксид, сернистый ангидрид, сажа, альдегиды, углеводороды, бенз/а/пирен.

Залповые выбросы загрязняющих веществ будут происходить организованно через отдельную трубу (источник №16).

4.1.2 Характеристика источников выбросов загрязняющих веществ

Котельная №1

Источник №1

Источник выброса - организованный.

Источниками выделения является:

Отопительный котел “МТУ 750 Квт” – 1 ед.

В качестве топлива используется природный газ.

Коэффициент нагрузки котла составляет 0,53.

Годовой расход газа составит:

72,15 м³/час или $72,15 \cdot 0,53 \cdot 148 \cdot 24 / 1000 = 135,827$ тыс. м³/год.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газозооушной смеси - 4,5 м/с.

Объемный расход газозооушной смеси – 0,1413 м³/с

Температура- 80° С

Время работы источника 24 часа в сутки 148 дней или 3552 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$P_{CO} = 0.001 \cdot C_{CO} \cdot B (1 - q_4 / 100)$ где;

B – расход топлива (т/год);

C_{CO} – выход оксида углерода при сжигании топлива;

q₄ - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$C_{CO} = q_3 \cdot R \cdot Q_t$ где;

q₃ – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива R = 0.5;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 \cdot 4,19 / 1000 = 34,4$.

$M_{CO} = 0,001 \cdot 0,5 \cdot 0,5 \cdot 34,4 \cdot 135,827 \cdot 0,995 = 1,16227$ т/год.

$Q_{CO} = 1,16227 \cdot 1000000 / (3600 \cdot 3552) = 0,0909$ г/сек.

Азота диоксид:

$P_{NO} = 0.001 \cdot B \cdot Q_t \cdot K_{NO} \cdot (1 - \rho)$ где;

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$M_{NO} = 0,001 \cdot 135,827 \cdot 34,4 \cdot 0,075 = 0,35043$ т/год.

$Q_{NO} = 0,35043 \cdot 1000000 / (3600 \cdot 3552) = 0,0274$ г/сек.

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$$M_{SO_2} = 0,02 * B * Sr * (1 - n_1) * (1 - n_2) \text{ г/сек}$$

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), $Sr = 0,009 \text{ кг/100 м}^3$;

n_1 – доля окислов серы, связываемых летучей золой топлива, $n_1 = 0$;

n_2 – доля окислов серы, улавливаемых золоуловителем, $n_2 = 0$;

Следовательно:

-валовый выброс:

$$M = 0,02 * 135,827 * 0,009 * (1 - 0) * (1 - 0) = 0,02445 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) * B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO_2} = 0,0188 * 0,0004 * 135,827 = 0,00102 \text{ т/год}$$

$$M_{\text{сум}} = 0,02445 + 0,00102 = 0,02547 \text{ т/год}$$

- мощность выброса:

$$Q_{SO_2} = 0,02547 * 1000000 / (3600 * 3552) = 0,00199 \text{ г/сек}$$

Котельная №2

Источник №2

Источник выброса - организованный.

Источниками выделения является:

Отопительный котел 60 Квт – 1 ед.

В качестве топлива используется природный газ.

Коэффициент нагрузки котла составляет 0,53.

Годовой расход газа составит $6,5 \text{ м}^3/\text{час}$ или $6,5 * 0,53 * 148 * 24 / 1000 = 12,237$ тыс. $\text{м}^3/\text{год}$.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газовой воздушной смеси - 4,5 м/с.

Объемный расход газовой воздушной смеси – $0,1413 \text{ м}^3/\text{с}$

Температура- 80°C

Время работы источника 24 часа в сутки 248 дней или 3552 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$$P_{CO} = 0.001 * C_{CO} * B (1 - q_4 / 100) \text{ где;}$$

B – расход топлива (т/год);

C_{CO} – выход оксида углерода при сжигании топлива;

q_4 – потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$$C_{CO} = q_3 * R * Q_t \text{ где;}$$

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива $R = 0.5$;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 * 4,19 / 1000 = 34,4$.

$$M_{CO} = 0,001 * 0,5 * 0,5 * 34,4 * 12,237 * 0,995 = 0,10471 \text{ т/год.}$$

$$Q_{CO} = 0,10471 * 1000000 / (3600 * 3552) = 0,00819 \text{ г/сек.}$$

Азота диоксид:

$$P_{NO} = 0.001 * B * Q_t * K_{NO} * (1 - \rho) \text{ где;}$$

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1 ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$$M_{NO} = 0,001 * 12,237 * 34,4 * 0,075 = 0,03157 \text{ т/год.}$$

$$Q_{NO} = 0,03157 * 1000000 / (3600 * 3552) = 0,00247 \text{ г/сек.}$$

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$$M_{SO_2} = 0,02 * B * Sr * (1 - n_1) * (1 - n_2) \text{ г/сек}$$

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), $Sr = 0,009 \text{ кг/100 м}^3$;

n_1 – доля окислов серы, связываемых летучей золой топлива, $n_1 = 0$;

n_2 – доля окислов серы, улавливаемых золоуловителем, $n_2 = 0$;

Следовательно:

-валовый выброс:

$$M = 0,02 * 12,237 * 0,009 * (1 - 0) * (1 - 0) = 0,0022 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) * B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO_2} = 0,0188 * 0,0004 * 12,237 = 0,00009 \text{ т/год}$$

$$M_{\text{сум}} = 0,0022 + 0,00009 = 0,00229 \text{ т/год}$$

- мощность выброса:

$$Q_{SO_2} = 0,00229 * 1000000 / (3600 * 3552) = 0,00018 \text{ г/сек}$$

Котельная №3

Источник №3

Источник выброса - организованный.

Источниками выделения является:

Отопительный котел "Ferroli" – 1 ед.

В качестве топлива используется природный газ.

Коэффициент нагрузки котла составляет 0,53.

Годовой расход газа составит $10 \text{ м}^3/\text{час}$ или $10 \cdot 0,53 \cdot 148 \cdot 24 / 1000 = 18,826$ тыс. $\text{м}^3/\text{год}$.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газозвушной смеси - 4,5 м/с.

Объемный расход газозвушной смеси – 0,1413 $\text{м}^3/\text{с}$

Температура- 80° С

Время работы источника 24 часа в сутки 365 дней или 2555 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$P_{\text{co}} = 0.001 \cdot C_{\text{co}} \cdot B (1 - q_4/100)$ где;

B – расход топлива (т/год);

C_{co} – выход оксида углерода при сжигании топлива;

q_4 - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$C_{\text{co}} = q_3 \cdot R \cdot Q_t$ где;

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива $R = 0.5$;

Q_t – низшая теплота сгорания натурального топлива ($\text{МДж}/\text{м}^3$) равна $8208 \cdot 4,19 / 1000 = 34,4$.

$M_{\text{CO}} = 0,001 \cdot 0,5 \cdot 0,5 \cdot 34,4 \cdot 18,826 \cdot 0,995 = 0,1611$ т/год.

$Q_{\text{CO}} = 0,1611 \cdot 1000000 / (3600 \cdot 3552) = 0,0126$ г/сек.

Азота диоксид:

$P_{\text{NO}} = 0.001 \cdot B \cdot Q_t \cdot K_{\text{NO}} \cdot (1 - \rho)$ где;

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива ($\text{МДж}/\text{м}^3$) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1 ГДж тепла ($\text{кг}/\text{ГДж}$), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$M_{\text{NO}} = 0,001 \cdot 18,826 \cdot 34,4 \cdot 0,075 = 0,04857$ т/год.

$Q_{\text{NO}} = 0,04857 \cdot 1000000 / (3600 \cdot 3552) = 0,0038$ г/сек.

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$$M_{SO_2} = 0,02 * B * Sr * (1 - n_1) * (1 - n_2) \text{ г/сек}$$

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), $Sr = 0,009 \text{ кг/100 м}^3$;

n_1 – доля окислов серы, связываемых летучей золой топлива, $n_1 = 0$;

n_2 – доля окислов серы, улавливаемых золоуловителем, $n_2 = 0$;

Следовательно:

-валовый выброс:

$$M = 0,02 * 18,826 * 0,009 * (1 - 0) * (1 - 0) = 0,00339 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) * B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO_2} = 0,0188 * 0,0004 * 18,826 = 0,00014 \text{ т/год}$$

$$M_{\text{сум}} = 0,00339 + 0,00014 = 0,00353 \text{ т/год}$$

- мощность выброса:

$$Q_{SO_2} = 0,00353 * 1000000 / (3600 * 3552) = 0,00027 \text{ г/сек}$$

Котельная №4

Источник №4-6

Источник выброса - организованный.

Источниками выделения является:

Отопительный котел “Viessman Vitoplex 200” 150 Квт – 3 ед.

В качестве топлива используется природный газ.

Коэффициент нагрузки котлов составляет 0,53.

Годовой расход газа на каждый котел составит $14,3 \text{ м}^3/\text{час}$ или $14,3 * 0,53 * 148 * 24 / 1000 = 26,92 \text{ тыс. м}^3/\text{год}$.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газовой смеси - 4,5 м/с.

Объемный расход газовой смеси – $0,1413 \text{ м}^3/\text{с}$

Температура- 80°C

Время работы источника 24 часа в сутки 148 дней или 3552 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$$P_{CO} = 0.001 * C_{CO} * B (1 - q_4 / 100) \text{ где;}$$

B – расход топлива (т/год);

C_{CO} – выход оксида углерода при сжигании топлива;

q_4 - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$C_{co} = q_3 * R * Q_t$ где;

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива $R = 0.5$;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 * 4,19 / 1000 = 34,4$.

$M_{CO} = 0,001 * 0,5 * 0,5 * 34,4 * 26,92 * 0,995 = 0,2303$ т/год.

$Q_{CO} = 0,2303 * 1000000 / (3600 * 3552) = 0,018$ г/сек.

Азота диоксид:

$P_{NO} = 0.001 * B * Q_t * K_{NO} * (1 - \rho)$ где;

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$M_{NO} = 0,001 * 26,92 * 34,4 * 0,075 = 0,06945$ т/год.

$Q_{NO} = 0,06945 * 1000000 / (3600 * 3552) = 0,00543$ г/сек.

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$M_{SO_2} = 0,02 * B * Sr * (1 - n_1) * (1 - n_2)$ г/сек

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), $Sr = 0,009$ кг/100 м³;

n_1 – доля окислов серы, связываемых летучей золой топлива, $n_1 = 0$;

n_2 – доля окислов серы, улавливаемых золоуловителем, $n_2 = 0$;

Следовательно:

-валовый выброс:

$M = 0,02 * 26,92 * 0,009 * (1 - 0) * (1 - 0) = 0,00485$ т/год

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) * B$, где:

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$M_{SO_2} = 0,0188 * 0,0004 * 26,92 = 0,0002$ т/год

$M_{сум} = 0,00485 + 0,0002 = 0,00505$ т/год

- мощность выброса:

$Q_{SO_2} = 0,00505 * 1000000 / (3600 * 3552) = 0,00039$ г/сек

АБК

Источник №7

Источник выброса - организованный.

Источниками выделения является:

Водогрейный котел “Slime” – 1 ед.

В качестве топлива используется природный газ.

Годовой расход газа составит 5,37 м³/час или $5,37 \cdot 280 \cdot 8 / 1000 = 12,029$ тыс. м³/год.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газовой смеси - 4,5 м/с.

Объемный расход газовой смеси – 0,1413 м³/с

Температура- 80° С

Время работы источника 8 часа в сутки 280 дней или 2240 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$P_{CO} = 0.001 \cdot C_{CO} \cdot B (1 - q_4/100)$ где;

B – расход топлива (т/год);

C_{CO} – выход оксида углерода при сжигании топлива;

q_4 - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$C_{CO} = q_3 \cdot R \cdot Q_t$ где;

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива R = 0.5;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 \cdot 4,19 / 1000 = 34,4$.

$M_{CO} = 0,001 \cdot 0,5 \cdot 0,5 \cdot 34,4 \cdot 12,029 \cdot 0,995 = 0,1029$ т/год.

$Q_{CO} = 0,1029 \cdot 1000000 / (3600 \cdot 2240) = 0,01276$ г/сек.

Азота диоксид:

$P_{NO} = 0.001 \cdot B \cdot Q_t \cdot K_{NO} \cdot (1 - \rho)$ где;

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$M_{NO} = 0,001 \cdot 12,029 \cdot 34,4 \cdot 0,075 = 0,03103$ т/год.

$Q_{NO} = 0,03103 \cdot 1000000 / (3600 \cdot 2240) = 0,00345$ г/сек.

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$M_{SO_2} = 0,02 \cdot B \cdot S_r \cdot (1 - n_1) \cdot (1 - n_2)$ г/сек

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), $Sr = 0,009 \text{ кг/100 м}^3$;

n1 – доля окислов серы, связываемых летучей золой топлива, $n1 = 0$;

n2 – доля окислов серы, улавливаемых золоуловителем, $n2 = 0$;

Следовательно:

-валовый выброс:

$$M = 0,02 * 12,029 * 0,009 * (1-0) * (1-0) = 0,00216 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) * B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO_2} = 0,0188 * 0,0004 * 12,029 = 0,00009 \text{ т/год}$$

$$M_{\text{сум}} = 0,00216 + 0,00009 = 0,00225 \text{ т/год}$$

- мощность выброса:

$$Q_{SO_2} = 0,00225 * 1000000 / (3600 * 2240) = 0,00028 \text{ г/сек}$$

Источник №8

Источник выброса - организованный.

Источниками выделения является:

Водогрейный котел “Аристон” – 1 ед.

В качестве топлива используется природный газ.

Годовой расход газа составит $0,89 \text{ м}^3/\text{час}$ или $0,89 * 280 * 8 / 1000 = 1,994 \text{ тыс. м}^3/\text{год}$.

Параметры источника:

Высота источника - 7 м.

Диаметр устья источника - 0,2 м.

Скорость газозооушной смеси - 4,5 м/с.

Объемный расход газозооушной смеси – $0,1413 \text{ м}^3/\text{с}$

Температура- 80°C

Время работы источника 8 часа в сутки 280 дней или 2240 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$$P_{co} = 0.001 * C_{co} * B (1 - q_4/100) \text{ где;}$$

B – расход топлива (т/год);

C_{co} – выход оксида углерода при сжигании топлива;

q_4 - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$$C_{co} = q_3 * R * Q_t \text{ где;}$$

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива R = 0.5;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 \cdot 4,19 / 1000 = 34,4$.

$$M_{CO} = 0,001 \cdot 0,5 \cdot 0,5 \cdot 34,4 \cdot 1,994 \cdot 0,995 = 0,01706 \text{ т/год.}$$

$$Q_{CO} = 0,01706 \cdot 1000000 / (3600 \cdot 2240) = 0,0021 \text{ г/сек.}$$

Азота диоксид:

$$P_{NO} = 0.001 \cdot B \cdot Q_t \cdot K_{NO} \cdot (1 - \rho) \text{ где;}$$

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$$M_{NO} = 0,001 \cdot 1,994 \cdot 34,4 \cdot 0,075 = 0,0051 \text{ т/год.}$$

$$Q_{NO} = 0,0051 \cdot 1000000 / (3600 \cdot 2240) = 0,0006 \text{ г/сек.}$$

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$$M_{SO2} = 0,02 \cdot B \cdot Sr \cdot (1 - n1) \cdot (1 - n2) \text{ г/сек}$$

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), Sr = 0,009 кг/100 м³;

n1 – доля окислов серы, связываемых летучей золой топлива, n1 = 0;

n2 – доля окислов серы, улавливаемых золоуловителем, n2 = 0;

Следовательно:

-валовый выброс:

$$M = 0,02 \cdot 1,994 \cdot 0,009 \cdot (1 - 0) \cdot (1 - 0) = 0,00036 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO2} = 1,88 \cdot 10^{-2} \cdot (H_2S) \cdot B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO2} = 0,0188 \cdot 0,0004 \cdot 1,994 = 0,000015 \text{ т/год}$$

$$M_{\text{сум}} = 0,00036 + 0,000015 = 0,000375 \text{ т/год}$$

- мощность выброса:

$$Q_{SO2} = 0,000375 \cdot 1000000 / (3600 \cdot 2240) = 0,000046 \text{ г/сек}$$

Кухня

Источник №9-15

Источник выброса - организованный.

Источниками выделения является:

4-комфорочная газовая плита – 7 ед.

В качестве топлива используется природный газ.

Годовой расход газа на каждую плиту составит 1,12 м³/час или $1,12 \cdot 280 \cdot 6 / 1000 = 1,882$ тыс. м³/год.

Параметры источника:

Высота источника - 5 м.

Диаметр устья источника - 0,12 м.

Скорость газозвдушной смеси - 4,5 м/с.

Объемный расход газозвдушной смеси – 0,05 м³/с

Температура- 55° С

Время работы источника 6 часа в сутки 280 дней или 1680 ч/год.

Углерода оксид:

Расчет выбросов углерода оксида выполняется по формуле:

$P_{co} = 0.001 \cdot C_{co} \cdot B (1 - q_4/100)$ где;

B – расход топлива (т/год);

C_{co} – выход оксида углерода при сжигании топлива;

q_4 - потери теплоты вследствие механической неполноты сгорания топлива, равно 0.5.

Выход оксида углерода при сжигании топлива рассчитывается по формуле;

$C_{co} = q_3 \cdot R \cdot Q_t$ где;

q_3 – потери теплоты вследствие химической неполноты сгорания топлива, равно 0.5 ;

R – коэффициент, учитывающий долю потери теплоты вследствие химической неполноты сгорания топлива, обусловленной наличием в продуктах сгорания углерода. Для газа топлива R = 0.5;

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна $8208 \cdot 4,19 / 1000 = 34,4$.

$M_{CO} = 0,001 \cdot 0,5 \cdot 0,5 \cdot 34,4 \cdot 1,882 \cdot 0,995 = 0,0161$ т/год.

$Q_{CO} = 0,0161 \cdot 1000000 / (3600 \cdot 1680) = 0,00266$ г/сек.

Азота диоксид:

$P_{NO} = 0.001 \cdot B \cdot Q_t \cdot K_{NO} \cdot (1 - \rho)$ где;

B – расход топлива (т/год);

Q_t – низшая теплота сгорания натурального топлива (МДж/м³) равна 34,4.

K_{NO} – параметр, характеризующий количество окислов азота, образующихся на 1ГДж тепла (кг/ГДж), равен 0.075;

ρ – коэффициент, зависящий от степени снижения выбросов оксидов азота в результате применения технических решений.

$M_{NO} = 0,001 \cdot 1,882 \cdot 34,4 \cdot 0,075 = 0,00486$ т/год.

$Q_{NO} = 0,00486 \cdot 1000000 / (3600 \cdot 1680) = 0,0008$ г/сек.

Ангидрид сернистый:

Расчет выбросов ангидрида сернистого выполняется по следующей формуле:

$M_{SO_2} = 0,02 \cdot B \cdot Sr \cdot (1 - n_1) \cdot (1 - n_2)$ г/сек

Где B – расход топлива

Sr – содержание серы в топливе на рабочую массу (согласно данных ГУ ТашГаз), Sr = 0,009 кг/100 м³;

n_1 – доля окислов серы, связываемых летучей золой топлива, $n_1 = 0$;

n_2 – доля окислов серы, улавливаемых золоуловителем, $n_2 = 0$;

Следовательно:

-валовый выброс:

$$M = 0,02 * 1,882 * 0,009 * (1-0) * (1-0) = 0,00034 \text{ т/год}$$

При наличии в топливе сероводорода расчет выбросов дополнительного количества оксидов серы в пересчете на сернистый ангидрид ведется по формуле:

$$M_{SO_2} = 1,88 * 10^{-2} * (H_2S) \times B, \text{ где:}$$

H_2S – содержание сероводорода в топливе (%) – 0,0004

Следовательно:

Валовый выброс:

$$M_{SO_2} = 0,0188 * 0,0004 * 1,882 = 0,000014 \text{ т/год}$$

$$M_{\text{сум}} = 0,00034 + 0,000014 = 0,000354 \text{ т/год}$$

- мощность выброса:

$$Q_{SO_2} = 0,000354 * 1000000 / (3600 * 1680) = 0,00006 \text{ г/сек}$$

Дизель-генераторная Источник №16* (Залповый)

Источником выделения продуктов сгорания солянки является:

Дизель-генератор, мощностью 40 Квт.

Согласно пункта 20 Положения о порядке разработки и согласования проектов экологических нормативов ПКМ №14 от 21.01.2014 г. единовременный выброс загрязняющих веществ от одного источника, продолжительность которого не превышает 5% от часов работы основного технологического оборудования в год, относится к залповому и не подлежит нормированию. Характеристика залповых выбросов заносятся в таблицу по форме согласно приложению №7 к настоящему Положению.

Время работы предприятия составляет 3552 ч/год.

Нормативный расход дизтоплива на генератор 1 т/год. Продолжительность работы генератора - 100 часов в год.

Параметры источника выброса:

Высота - 2,0 м

Диаметр - 0,1 м

Скорость выхода газовойдушной смеси - 12,7 м/сек

Объем смеси - 0,1 м³/сек

Температура - 200 °С

Качественно-количественные характеристики выделений вредных веществ определены по методическим указаниям /2/: максимальный выброс по формуле:

$$Q = e \times P / 3600 \text{ (г/сек)}$$

Где: e - удельный выброс вещества на 1 квт*ч мощности генератора

P - мощность дизельгенератора - 40 квт*ч

Значения выбросов с дизель-генератором принимаем по табл. 1.6.1:

- углерода оксид - 6,2 г/кВт*ч

- углеводороды - 2,9 г/кВт*ч

- азота диоксид - 9,6 г/кВт*ч

- двуокись серы - 1,2 г/кВт*ч

- сажа - 0,5 г/кВт*ч

- бенз/а/пирен - $1,2 \times 10^{-5}$ г/кВт*ч

- формальдегид - 0,12 г/кВт*ч

Валовый выброс определяется по формуле:

$$M = g \times G / 3600 \text{ (т/год)}$$

Где:

g - удельный выброс вещества на 1 кг дизтоплива

G - годовой расход дизтоплива – 1 тонн/год или 10 кг/час

Значения выбросов g дизельгенератором принимаем по табл. 1.6.3:

- углерода оксид - 26,0 г/кг топлива

- углеводороды - 12,0 г/кг

- азота диоксид - 40 г/кг

- двуокись серы - 5,0 г/кг

- сажа - 2,0 г/кг

- бенз/а/пирен - $5,5 \times 10^{-5}$ г/кг

- формальдегид - 0,5 г/кг

Для стационарных дизельных установок зарубежного производства, со встроенным катализатором, отвечающие требованиям природоохранного законодательства Европейского союза выбросы могут быть уменьшены по окиси углерода в 2 раза, по двуокиси азота - в 2,5 раза, по саже, углеводородам, формальдегиду, бенз/а/пирену в 3,5 раза.

Выброс вредных веществ в атмосферу составит:

углерода оксид

$$Q = 6,2 * 40 / 3600 / 2 = 0,0344 \text{ г/сек}$$

$$M = 26,0 * 1 / 1000 / 2 = 0,013 \text{ т/год}$$

углеводороды

$$Q = 2,9 * 40 / 3600 / 3,5 = 0,0092 \text{ г/сек}$$

$$M = 12 * 1 / 1000 / 3,5 = 0,00343 \text{ т/год}$$

азота диоксид

$$Q = 9,6 * 40 / 3600 / 2,5 = 0,04267 \text{ г/сек}$$

$$M = 40 * 1 / 1000 / 2,5 = 0,016 \text{ т/год}$$

сернистый ангидрид

$$Q = 1,2 * 40 / 3600 = 0,0133 \text{ г/сек}$$

$$M = 5,0 * 1 / 1000 = 0,005 \text{ т/год}$$

сажа

$$Q = 0,5 * 40 / 3600 / 3,5 = 0,00159 \text{ г/сек}$$

$$M = 2,0 * 1 / 1000 / 3,5 = 0,00057 \text{ т/год}$$

Бенз/а/пирен

$$Q = 1,2 / 100000 * 40 / 3600 / 3,5 = 0,00000038 \text{ г/сек}$$

$$M = 5,5 / 100000 * 1 / 1000 / 3,5 = 0,000000016 \text{ т/год}$$

формальдегид

$$Q = 0,12 * 40 / 3600 / 3,5 = 0,00038 \text{ г/сек}$$

$$M = 0,5 * 1 / 1000 / 3,5 = 0,00014 \text{ т/год}$$

4.1.3 Проведение расчетов приземных концентраций, анализ полей рассеивания загрязняющих веществ

Согласно Руководящим документам Республики Узбекистан и ОНД 86, для предприятий 1-3 категории нормативные выбросы по ингредиентам должны удовлетворять следующим условиям: C_m на границе промплощадки $\leq \text{ПДК} \times \text{Квота}$. Если для вещества установлена среднесуточная и отсутствует максимально-разовая ПДК, то должно выполняться условие (ОНД-86, Раздел 8) – $0,1 C_m$ на границе промплощадки $\leq \text{ПДК} \times \text{Квота}$.

Метеорологические характеристики и коэффициенты, влияющие на рассеивания в атмосфере г. Ташкента и Ташкентской области приведены в общих сведениях о предприятии.

Расчет рассеивания загрязняющих веществ в приземном слое атмосферы выполнен по программе «Эколог 3.0» с обработкой графической информации с использованием программы «Экограф».

Расчет рассеивания загрязняющих веществ показал следующее:

- азота диоксид - наибольшая концентрация за границей промплощадки 0,16 ПДК, (квота 0,2 ПДК)
- углерода оксид - сумма максимальных приземных концентраций 0,0105738 ПДК. При выполнении условия Ст меньше 0.1 ПДК, в соответствии с ОНД-86, дальнейший расчёт рассеивания не производится, из-за его нецелесообразности;
- сернистый ангидрид - сумма максимальных приземных концентраций 0,0023165 ПДК. При выполнении условия Ст меньше 0.1 ПДК, в соответствии с ОНД-86, дальнейший расчёт рассеивания не производится, из-за его нецелесообразности;

Анализ приведенных расчетов показал, что для всех загрязняющих веществ нормативы ПДВ достигаются на существующее положение.

В приложении приведены источники, по отдельным ингредиентам дающие наибольший вклад в выбросы загрязняющих веществ и в их значение на границе промплощадки и в расчетных точках.

Параметры источников выбросов приведены в таблицах 4.1, 4.2 ниже.

Таблица 4.1

ХАРАКТЕРИСТИКА ИСТОЧНИКОВ ВЫДЕЛЕНИЯ ЗАГРЯЗНЯЮЩИХ ВЕЩЕСТВ

Наименование производства, цеха, участка	Наименование источника выделения	Наименование выпускаемой продукции (выполняемой операции)	Номер Источн ика	Время работы источника выделения, час		Наименование загрязняющего вещества	Количество загрязняющего вещества, отходящего от источника выделения			
				в сут	за год		сред. мг/м³	максимальное		сумм
								мг/м³	г/с	
1	2	3	4	5	6	7	8	9	10	11
Котельная №1	Отопительный Котел “МТУ 750 Квт” – 1 ед.	Отопление помещений	1	24	3552	Углерода оксид			0,0909	1,16227
						Азота диоксид			0,0274	0,35043
						Сернистый ангидрид			0,00199	0,02547
Котельная №2	Отопительный котел 60 Квт – 1 ед.	Отопление помещений	2	24	3552	Углерода оксид			0,00819	0,10471
						Азота диоксид			0,00247	0,03157
						Сернистый ангидрид			0,00018	0,00229
Котельная №3	Отопительный котел “Ferrolі” – 1 ед.	Отопление помещений	3	24	3552	Углерода оксид			0,0126	0,1611
						Азота диоксид			0,0038	0,04857
						Сернистый ангидрид			0,00027	0,00353
Котельная №4	Отопительный котел “Viessman Vitoplex 200” 150 Квт – 1 ед.	Отопление помещений	4	24	3552	Углерода оксид			0,018	0,2303
						Азота диоксид			0,00543	0,06945
						Сернистый ангидрид			0,00039	0,00505
	Отопительный котел “Viessman Vitoplex 200” 150 Квт – 1 ед.	Отопление помещений	5	24	3552	Углерода оксид			0,018	0,2303
						Азота диоксид			0,00543	0,06945
						Сернистый ангидрид			0,00039	0,00505
	Отопительный котел “Viessman Vitoplex 200” 150 Квт – 1 ед.	Отопление помещений	6	24	3552	Углерода оксид			0,018	0,2303
						Азота диоксид			0,00543	0,06945
						Сернистый ангидрид			0,00039	0,00505
АБК	Водогрейный котел “Slime” – 1 ед.	Обеспечение ГВС	7	8	2240	Углерода оксид			0,01276	0,1029
						Азота диоксид			0,00345	0,03103
						Сернистый ангидрид			0,00028	0,00225
АБК	Водогрейный котел “Аристон” – 1 ед.	Обеспечение ГВС	8	8	2240	Углерода оксид			0,0021	0,01706
						Азота диоксид			0,0006	0,0051
						Сернистый ангидрид			0,000046	0,000375
Кухня	4-комфорочная газовая плита – 1	Приготовление сред	9	6	1680	Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486

	ед.					Сернистый ангидрид			0,00006	0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	10	6	1680	Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486
						Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	11	6	1680	Азота диоксид			0,0008	0,00486
						Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	12	6	1680	Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486
						Сернистый ангидрид			0,00006	0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	13	6	1680	Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486
						Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	14	6	1680	Азота диоксид			0,0008	0,00486
						Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
						Азота диоксид			0,0008	0,00486
Кухня	4-комфорочная газовая плита – 1 ед.	Приготовление сред	15	6	1680	Сернистый ангидрид			0,00006	0,000354
						Углерода оксид			0,00266	0,0161
ВСЕГО										3,11225

Таблица 4.2

ХАРАКТЕРИСТИКА ИСТОЧНИКОВ ВЫБРОСОВ ЗАГРЯЗНЯЮЩИХ ВЕЩЕСТВ

Наименование производства № цеха, участка и т.д.	Источники выделения	Наименование источника выброса	Время работы источника выброса	№ ист. на карте	Высота источника выброса, м	Диаметр трубы, м	Параметры газовоздушной смеси			Координаты источников на 2-карте схеме, м		Наименование загрязняющих веществ	Выбросы загрязняющих веществ			
							Объём, м³/с	Скорость, м/с	Температура, °C	Одного конца точечн. Линейн. плоскостн	X 1		Y 1	г/с	мг/м³	т/г
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Котельная №1	Отопительный Котел “МТУ 750 КВт” – 1 ед.	организо ванный	3552	1	7	0,2	0,1413	4,5	75			Углерода оксид	0,0909		1,16227	
												Азота диоксид	0,0274		0,35043	
												Сернистый ангидрид	0,00199		0,02547	
Котельная №2	Отопительный котел 60 КВт – 1 ед.	организо ванный	3552	2	7	0,2	0,1413	4,5	75			Углерода оксид	0,00819		0,10471	
												Азота диоксид	0,00247		0,03157	
												Сернистый ангидрид	0,00018		0,00229	
Котельная №3	Отопительный котел “Ferrolі” – 1 ед.	организо ванный	3552	3	7	0,2	0,1413	4,5	75			Углерода оксид	0,0126		0,1611	
												Азота диоксид	0,0038		0,04857	
												Сернистый ангидрид	0,00027		0,00353	
Котельная №4	Отопительный котел “Viessman Vitoplex 200” 150 КВт – 1 ед.	организо ванный	3552	4	7	0,2	0,1413	4,5	75			Углерода оксид	0,018		0,2303	
												Азота диоксид	0,00543		0,06945	
												Сернистый ангидрид	0,00039		0,00505	
	Отопительный котел “Viessman Vitoplex 200” 150 КВт – 1 ед.	организо ванный	3552	5	7	0,2	0,1413	4,5	75			Углерода оксид	0,018		0,2303	
												Азота диоксид	0,00543		0,06945	
												Сернистый ангидрид	0,00039		0,00505	
	Отопительный котел “Viessman Vitoplex	организо ванный	3552	6	7	0,2	0,1413	4,5	75			Углерода оксид	0,018		0,2303	

	200” 150 Квт – 1 ед.														
												Азота диоксид	0,00543		0,06945
												Сернистый ангидрид	0,00039		0,00505
АБК	Водогрейный котел “Slime” – 1 ед.	организованный	2240	7	7	0,2	0,1413	4,5	75			Углерода оксид	0,01276		0,1029
												Азота диоксид	0,00345		0,03103
												Сернистый ангидрид	0,00028		0,00225
АБК	Водогрейный котел “Аристон” – 1 ед.	организованный	2240	8	7	0,2	0,1413	4,5	75			Углерода оксид	0,0021		0,01706
												Азота диоксид	0,0006		0,0051
												Сернистый ангидрид	0,000046		0,000375
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	9	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	10	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	11	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	12	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная	организо	1680	13	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161

	газовая плита – 1 ед.	ванный													
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	14	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
Кухня	4-комфорочная газовая плита – 1 ед.	организованный	1680	15	5	0,12	0,05	4,5	55			Углерода оксид	0,00266		0,0161
												Азота диоксид	0,0008		0,00486
												Сернистый ангидрид	0,00006		0,000354
ВСЕГО															3,11225

Таблица 4.3

Суммарные выбросы загрязняющих ингредиентов в атмосферу

№ п/п	Наименование загрязняющего ингредиента	Всего выбрасывается в атмосферу	
		т/год	%
1	2	3	4
1	Углерода оксид	2,35164	75,56
2	Азота диоксид	0,70907	22,78
3	Сернистый ангидрид	0,051543	1,659
	Всего	3,11225	100

Таблица 4.4

Перечень загрязняющих ингредиентов

Наименование вещества	ПДКм, ОБУВ*, мг/м ³	Класс опасности	Квота в долях ПДК	Максималь ная концентрац ия в долях ПДК	Выбросы вещества т/год
1	2	3	4	5	6
Углерода оксид	5,0	4	0,33	0,0105738	2,35164
Азота диоксид	0,085	2	0,2	0,16	0,70907
Сернистый ангидрид	0,5	3	0,25	0,0023165	0,051543

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Предприятие; УСЭБиОЗ г. Ташкента

Город Ташкент

Район Алмазар

Адрес предприятия: г. Ташкент, Алмазарский район, улица Карасарай 341

Разработчик Фирма "ИНТЕГРАЛ"

Вариант исходных данных: 1, вариант исходных данных

Вариант расчета: вариант расчета

Расчет проведен на лето

Расчетный модуль: "ОНД-86 стандартный"

Расчетные константы: E1= 0,1, E2=0,1, E3=0,1, S=999999,99 кв.км.

Метеорологические параметры

Средняя температура наружного воздуха самого жаркого месяца	35,7° C
Средняя температура наружного воздуха самого холодного месяца	-1,6° C
Коэффициент, зависящий от температурной стратификации атмосферы A	200
Максимальная скорость ветра в данной местности (повторяемость превышения в пределах 5%)	3,3 м/с

Структура предприятия (площадки, цеха)

Номер	Наименование площадки (цеха)
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Параметры источников выбросов

Учет:

"%" - источник учитывается с исключением из фона;

"+" - источник учитывается без исключения из фона;

"-" - источник не учитывается и его вклад исключается из фона.

При отсутствии отметок источник не учитывается.

Типы источников:

1 - точечный;

2 - линейный;

3 - неорганизованный;

4 - совокупность точечных, объединенных для расчета в один площадной;

5 - неорганизованный с нестационарной по времени мощностью выброса;

6 - точечный, с зонтом или горизонтальным направлением выброса;

7 - совокупность точечных с зонтами или горизонтальным направлением выброса;

8 - автомагистраль.

Учет при расч.	№ пл.	№ цеха	№ ист.	Наименование источника	Вар.	Тип	Высота ист. (м)	Диаметр устья (м)	Объем ГВС (куб.м/с)	Скорость ГВС (м/с)	Темп. ГВС (°C)	Коеф. рел.	Коорд. X1-ос. (м)	Коорд. Y1-ос. (м)	Коорд. X2-ос. (м)	Коорд. Y2-ос. (м)	Ширина источ. (м)
%	0	0	1	Отопительный Котел "МТУ 750 Квт"	1	1	7,0	0,20	0,14137	4,50000	75	1,0	308,0	165,0	308,0	165,0	0,00
Код в-ва		Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um
0301		Азота диоксид (Азот (IV) оксид)			0,0274000		0,0000000		1		0,081	81,9	0,5		0,081	81,9	0,5
0330		Сера диоксид (Ангидрид сернистый)			0,0019900		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5
0337		Углерод оксид			0,0909000		0,0000000		1		0,005	81,9	0,5		0,005	81,9	0,5
%	0	0	2	Отопительный котел 60 Квт	1	1	7,0	0,20	0,14137	4,50000	75	1,0	310,0	152,0	310,0	152,0	0,00
Код в-ва		Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um
0301		Азота диоксид (Азот (IV) оксид)			0,0024700		0,0000000		1		0,007	81,9	0,5		0,007	81,9	0,5
0330		Сера диоксид (Ангидрид сернистый)			0,0001800		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5
0337		Углерод оксид			0,0081900		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5
%	0	0	3	Отопительный котел "Ferrol"	1	1	7,0	0,20	0,14137	4,50000	75	1,0	269,0	185,0	269,0	185,0	0,00
Код в-ва		Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um
0301		Азота диоксид (Азот (IV) оксид)			0,0038000		0,0000000		1		0,011	81,9	0,5		0,011	81,9	0,5
0330		Сера диоксид (Ангидрид сернистый)			0,0002700		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5
0337		Углерод оксид			0,0126000		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5
%	0	0	4	Отопительный котел "Viessman Vitoplex 200" 150 Квт	1	1	7,0	0,20	0,14137	4,50000	75	1,0	246,0	143,0	246,0	143,0	0,00
Код в-ва		Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um
0301		Азота диоксид (Азот (IV) оксид)			0,0054300		0,0000000		1		0,016	81,9	0,5		0,016	81,9	0,5
0330		Сера диоксид (Ангидрид сернистый)			0,0003900		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5
0337		Углерод оксид			0,0180000		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5
%	0	0	5	Отопительный котел "Viessman Vitoplex 200" 150 Квт	1	1	7,0	0,20	0,14137	4,50000	75	1,0	268,0	151,0	268,0	151,0	0,00
Код в-ва		Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um
0301		Азота диоксид (Азот (IV) оксид)			0,0054300		0,0000000		1		0,016	81,9	0,5		0,016	81,9	0,5
0330		Сера диоксид (Ангидрид сернистый)			0,0003900		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5
0337		Углерод оксид			0,0180000		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5
%	0	0	6	Отопительный котел "Viessman Vitoplex 200" 150 Квт	1	1	7,0	0,20	0,14137	4,50000	75	1,0	311,0	180,0	311,0	180,0	0,00

Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0054300		0,0000000		1		0,016	81,9	0,5		0,016	81,9	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0003900		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5	
0337	Углерод оксид			0,0180000		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5	
%	0	0	7	Водогрейный котел “Slime”	1	1	7,0	0,20	0,14137	4,50000	75	1,0	266,0	157,0	266,0	157,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0034500		0,0000000		1		0,010	81,9	0,5		0,010	81,9	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0002800		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5	
0337	Углерод оксид			0,0127600		0,0000000		1		0,001	81,9	0,5		0,001	81,9	0,5	
%	0	0	8	Водогрейный котел “Аристон”	1	1	7,0	0,20	0,14137	4,50000	75	1,0	266,0	162,0	266,0	162,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0006000		0,0000000		1		0,002	81,9	0,5		0,002	81,9	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000460		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5	
0337	Углерод оксид			0,0021000		0,0000000		1		0,000	81,9	0,5		0,000	81,9	0,5	
%	0	0	9	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	266,0	167,0	266,0	167,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
%	0	0	10	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	309,0	174,0	309,0	174,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
%	0	0	11	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	243,0	142,0	243,0	142,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
%	0	0	12	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	257,0	143,0	257,0	143,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
%	0	0	13	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	267,0	144,0	267,0	144,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
%	0	0	14	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	283,0	142,0	283,0	142,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)		Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um	
0301	Азота диоксид (Азот (IV) оксид)			0,0008000		0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5	
0330	Сера диоксид (Ангидрид сернистый)			0,0000600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	
0337	Углерод оксид			0,0026600		0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5	

%	0	0	15	4-комфорочная газовая плита	1	1	5,0	0,12	0,05089	4,50000	55	1,0	309,0	145,0	309,0	145,0	0,00
Код в-ва	Наименование вещества			Выброс, (г/с)	Выброс, (т/г)		F	Лето:	См/ПДК	Xm	Um	Зима:	См/ПДК	Xm	Um		
0301	Азота диоксид (Азот (IV) оксид)			0,0008000	0,0000000		1		0,004	66,5	0,5		0,004	66,5	0,5		
0330	Сера диоксид (Ангидрид сернистый)			0,0000600	0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5		
0337	Углерод оксид			0,0026600	0,0000000		1		0,000	66,5	0,5		0,000	66,5	0,5		

Выбросы источников по веществам

Учет:

"%" - источник учитывается с исключением из фона;

"+" - источник учитывается без исключения из фона;

"-" - источник не учитывается и его вклад исключается из фона.

При отсутствии отметок источник не учитывается.

Источники, помеченные к учету знаком «-» или непомеченные («»), в общей сумме не учитываются

Типы источников:

1 - точечный;

2 - линейный;

3 - неорганизованный;

4 - совокупность точечных, объединенных для расчета в один площадной;

5 - неорганизованный с нестационарной по времени мощностью выброса;

6 - точечный, с зонтом или горизонтальным направлением выброса;

7 - совокупность точечных с зонтами или горизонтальным направлением выброса;

8 - автомагистраль.

Вещество: 0301 Азота диоксид (Азот (IV) оксид)

№ пл.	№ цех	№ ист.	Тип	Учет	Выброс (г/с)	F	Лето			Зима		
							См/ПДК	Хм	Um (м/с)	См/ПДК	Хм	Um (м/с)
0	0	1	1	%	0,0274000	1	0,0809	81,94	0,5000	0,0809	81,94	0,5000
0	0	2	1	%	0,0024700	1	0,0073	81,94	0,5000	0,0073	81,94	0,5000
0	0	3	1	%	0,0038000	1	0,0112	81,94	0,5000	0,0112	81,94	0,5000
0	0	4	1	%	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	5	1	%	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	6	1	%	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	7	1	%	0,0034500	1	0,0102	81,94	0,5000	0,0102	81,94	0,5000
0	0	8	1	%	0,0006000	1	0,0018	81,94	0,5000	0,0018	81,94	0,5000
0	0	9	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	10	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	11	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	12	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	13	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	14	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	15	1	%	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
Итого:					0,0596100		0,1862			0,1862		

Вещество: 0330 Сера диоксид (Ангидрид сернистый)

№ пл.	№ цех	№ ист.	Тип	Учет	Выброс (г/с)	F	Лето			Зима		
							См/ПДК	Хм	Um (м/с)	См/ПДК	Хм	Um (м/с)
0	0	1	1	%	0,0019900	1	0,0010	81,94	0,5000	0,0010	81,94	0,5000
0	0	2	1	%	0,0001800	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	3	1	%	0,0002700	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	4	1	%	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	5	1	%	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	6	1	%	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	7	1	%	0,0002800	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	8	1	%	0,0000460	1	0,0000	81,94	0,5000	0,0000	81,94	0,5000
0	0	9	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	10	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	11	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	12	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	13	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	14	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	15	1	%	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
Итого:					0,0043560		0,0023			0,0023		

Вещество: 0337 Углерод оксид

№ пл.	№ цех	№ ист.	Тип	Учет	Выброс (г/с)	F	Лето			Зима		
							См/ПДК	Хм	Um (м/с)	См/ПДК	Хм	Um (м/с)
0	0	1	1	%	0,0909000	1	0,0046	81,94	0,5000	0,0046	81,94	0,5000

0	0	2	1	%	0,0081900	1	0,0004	81,94	0,5000	0,0004	81,94	0,5000
0	0	3	1	%	0,0126000	1	0,0006	81,94	0,5000	0,0006	81,94	0,5000
0	0	4	1	%	0,0180000	1	0,0009	81,94	0,5000	0,0009	81,94	0,5000
0	0	5	1	%	0,0180000	1	0,0009	81,94	0,5000	0,0009	81,94	0,5000
0	0	6	1	%	0,0180000	1	0,0009	81,94	0,5000	0,0009	81,94	0,5000
0	0	7	1	%	0,0127600	1	0,0006	81,94	0,5000	0,0006	81,94	0,5000
0	0	8	1	%	0,0021000	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	9	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	10	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	11	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	12	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	13	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	14	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
0	0	15	1	%	0,0026600	1	0,0002	66,53	0,5000	0,0002	66,53	0,5000
Итого:					0,1991700		0,0106			0,0106		

Выбросы источников по группам суммации

Учет:

"%" - источник учитывается с исключением из фона;

"+" - источник учитывается без исключения из фона;

"-" - источник не учитывается и его вклад исключается из фона.

При отсутствии отметок источник не учитывается.

Типы источников:

1 - точечный;

2 - линейный;

3 - неорганизованный;

4 - совокупность точечных, объединенных для расчета в один площадной;

5 - неорганизованный с нестационарной по времени мощностью выброса;

6 - точечный, с зонтом или горизонтальным направлением выброса;

7 - совокупность точечных с зонтами или горизонтальным направлением выброса;

8 - автомагистраль.

Источники, помеченные к учету знаком «-» или непомеченные («»), в общей сумме не учитываются

Группа суммации: 6204

№ пл.	№ цех	№ ист.	Тип	Учет	Код в-ва	Выброс (г/с)	F	Лето			Зима		
								См/ПДК	Xm	Um (м/с)	См/ПДК	Xm	Um (м/с)
0	0	1	1	%	0301	0,0274000	1	0,0809	81,94	0,5000	0,0809	81,94	0,5000
0	0	1	1	%	0330	0,0019900	1	0,0010	81,94	0,5000	0,0010	81,94	0,5000
0	0	2	1	%	0301	0,0024700	1	0,0073	81,94	0,5000	0,0073	81,94	0,5000
0	0	2	1	%	0330	0,0001800	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	3	1	%	0301	0,0038000	1	0,0112	81,94	0,5000	0,0112	81,94	0,5000
0	0	3	1	%	0330	0,0002700	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	4	1	%	0301	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	4	1	%	0330	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	5	1	%	0301	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	5	1	%	0330	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	6	1	%	0301	0,0054300	1	0,0160	81,94	0,5000	0,0160	81,94	0,5000
0	0	6	1	%	0330	0,0003900	1	0,0002	81,94	0,5000	0,0002	81,94	0,5000
0	0	7	1	%	0301	0,0034500	1	0,0102	81,94	0,5000	0,0102	81,94	0,5000
0	0	7	1	%	0330	0,0002800	1	0,0001	81,94	0,5000	0,0001	81,94	0,5000
0	0	8	1	%	0301	0,0006000	1	0,0018	81,94	0,5000	0,0018	81,94	0,5000
0	0	8	1	%	0330	0,0000460	1	0,0000	81,94	0,5000	0,0000	81,94	0,5000
0	0	9	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	9	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	10	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	10	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	11	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	11	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	12	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	12	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	13	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	13	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	14	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	14	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
0	0	15	1	%	0301	0,0008000	1	0,0038	66,53	0,5000	0,0038	66,53	0,5000
0	0	15	1	%	0330	0,0000600	1	0,0000	66,53	0,5000	0,0000	66,53	0,5000
Итого:						0,0639660		0,1885			0,1885		

Расчет проводился по веществам (группам суммации)

Код	Наименование вещества	Предельно Допустимая Концентрация			Поправ. коэф. к ПДК/ОБУ В	Фоновая концентр.	
		Тип	Спр. значение	Исп. в расч.		Учет	Интерп.
0301	Азота диоксид (Азот (IV) оксид)	ПДК м/р	0,085	0,085	1	Нет	Нет
0330	Сера диоксид (Ангидрид сернистый)	ПДК м/р	0,5	0,5	1	Нет	Нет
0337	Углерод оксид	ПДК м/р	5	5	1	Нет	Нет
6204	Серы диоксид, азота диоксид	Группа	-	-	1	Нет	Нет

Перебор метеопараметров при расчете Набор-автомат

Перебор скоростей ветра осуществляется автоматически

Направление ветра

Начало сектора	Конец сектора	Шаг перебора ветра
0	360	1

Расчетные области

Расчетные площадки

№	Тип	Полное описание площадки				Ширина, (м)	Шаг, (м)		Высота, (м)	Комментарий
		Координаты середины 1-й стороны (м)		Координаты середины 2-й стороны (м)						
		X	Y	X	Y		X	Y		
1	Заданная	0	180	540	180	360	25	25	2	

Вещества, расчет для которых не целесообразен Критерий целесообразности расчета E3=0,1

Код	Наименование	Сумма См/ПДК
0330	Сера диоксид (Ангидрид сернистый)	0,0023165
0337	Углерод оксид	0,0105738





4.2 Источники загрязнения сточных вод, виды воздействия и решения по уменьшению отрицательного влияния на окружающую среду

Вода на рассматриваемом предприятии используется для хозяйственно-питьевого водоснабжения из горводопровода.

Хозяйственно-питьевые нужды

Всего на предприятии будут работать 38 человек. Режим работы - 330 дней в году. Норма водопотребления в сутки на одного служащего согласно КМК 2.04.01.98г., составляет – 12 литров в сутки, тогда:

$$Q = 38 \cdot 12 / 1000 = 0,456 \text{ м}^3/\text{сут}$$

$$M = 0,456 \cdot 330 / 1000 = 0,15 \text{ тыс.м}^3/\text{год}$$

Водоотведение составит: 0,456 м³/сут или 0,15 тыс.м³/год.

Душевые

На территории предприятия имеется 4 душевые сетки, в проектируемом здании также будут организованы еще 4 душевые сетки. Общее количество душевых сеток составит 8 ед. Норма водопотребления на одну душевую сетку, согласно КМК 2.04.01.98г., составляет 500 л в смену, тогда

$$Q = 8 \cdot 500 / 1000 = 4,0 \text{ м}^3/\text{сут}$$

$$M = 4,0 \cdot 330 / 1000 = 1,32 \text{ тыс.м}^3/\text{год}$$

Водоотведение составит: 4,0 м³/сут или 1,32 тыс.м³/год.

Санузлы

На территории предприятия имеется 4 санузла, в проектируемом здании также будут организованы 4 санузла. Общее количество санузлов составит 8 ед. Норма водопотребления, согласно КМК 2.04.01.98г., составляет 83 л/час, режим работы 2 часа в сутки, тогда

$$Q = 8 \cdot 83 \cdot 2 / 1000 = 1,328 \text{ м}^3/\text{сут}$$

$$M = 1,328 \cdot 330 / 1000 = 0,438 \text{ тыс.м}^3/\text{год}$$

Водоотведение составит: 1,328 м³/сут или 0,438 тыс.м³/год.

Рукомойники

На территории предприятия имеется 4 рукомойника, в проектируемом здании также будут организованы еще 4 рукомойника. Общее количество рукомойников составит 8 ед. Норма водопотребления, согласно КМК 2.04.01.98г., составляет 30 л/час, режим работы 2 часа в сутки, тогда

$$Q = 8 \cdot 30 \cdot 2 / 1000 = 0,48 \text{ м}^3/\text{сут}$$

$$M = 0,48 \cdot 330 / 1000 = 0,158 \text{ тыс.м}^3/\text{год}$$

Водоотведение составит: 0,48 м³/сут или 0,158 тыс.м³/год.

Столовая

На территории предприятия будет функционировать кухня со столовой, на 40 посадочных мест, количество приготавливаемых блюд в сутки 80, норма водопотребления на одно блюдо составляет 12 л, тогда

$$Q = 80 \cdot 12 / 1000 = 0,96 \text{ м}^3/\text{сут}$$

$$M = 0,96 \cdot 330 / 1000 = 0,317 \text{ тыс.м}^3/\text{год}$$

Мытье полов в помещениях

Общая площадь поверхности полов, подлежащая мытью, составляет около 900 м². Мытье полов производят 2 раза в сутки.

Норматив расхода воды, согласно КМК 2.04.01.98г., составляет 0,5 л на 1 м² моющей поверхности.

Расход воды на мытье полов составит:

$$Q = 900 * 0,5 * 2 / 1000 = 0,9 \text{ м}^3/\text{сут}$$

$$M = 0,9 * 330 / 1000 = 0,297 \text{ тыс. м}^3/\text{год}$$

Лаборатории

На территории предприятия функционируют лаборатории для проведения лабораторных исследований. Количество сотрудников в лабораториях составит – 10 человек. Режим работы лабораторий 330 дней в год. Согласно КМК 2.04.01.98г. «Внутренний водопровод и канализация зданий», норма водопотребления в средние сутки на одного работника лаборатории химического профиля составляет 460 литров, тогда

$$Q = 460 * 10 / 1000 = 4,6 \text{ м}^3/\text{сут}$$

$$M = 4,6 * 330 / 1000 = 1,518 \text{ тыс. м}^3/\text{год}$$

Водоотведение в систему городской канализации составляет 4,6 м³/сут или 1,518 тыс.м³/год.

Прачечная (стиральная машина-автомат на 10 кг)

На территории предприятия имеется прачечная, норма водопотребления, согласно паспорта стиральной машины-автомат на 10 кг, составляет 126 литров на один цикл стирки. Предполагаемое количество стирок составит 1 раз в неделю, тогда

Расход воды на прачечную составит:

$$M = 52 * 126 / 1000 / 1000 = 0,00655 \text{ тыс. м}^3/\text{год}$$

$$Q = 0,00655 * 1000 / 330 = 0,0198 \text{ ср. м}^3/\text{сут}$$

Водоотведение в систему городской канализации составляет 0,0198 м³/сут или 0,00655 тыс.м³/год.

Полив территории и зеленых насаждений

Площадь усовершенствованных покрытий (асфальтовые и брусчатка) составит 3526,8 м². Согласно КМК 2.04.01.98г. «Внутренний водопровод и канализация зданий» норма расходы воды на 1 м² составляет 0,5 л/м², полив будет производится 2 раза в сутки, 180 дней в году, тогда

$$Q = 3526,8 * 0,5 * 2 / 1000 = 3,527 \text{ м}^3/\text{сут}$$

$$M = 3,527 * 180 / 1000 = 0,6348 \text{ тыс. м}^3/\text{год}$$

Площадь грунтовых покрытий составляет 11900 м². Площадь зеленых насаждений, подлежащих поливу составляет 6000 м². Согласно КМК 2.04.01.98г. «Внутренний водопровод и канализация зданий» норма расходы воды на 1 м² составляет 6 л/м², 180 дней в году, два раза в сутки, тогда

$$Q = 6000 * 6 * 2 / 1000 = 72,0 \text{ м}^3/\text{сут}$$

$$M = 72,0 * 180 / 1000 = 12,96 \text{ тыс. м}^3/\text{год}$$

Сброс хоз.бытовых стоков будет также производиться в централизованную канализационную сеть города. Подземные сооружения - канализационные трубы, канализационные колодцы выполняются из чугунных труб и из сборных железобетонных элементов, бетона, покрытых гидроизоляцией.

Сброс стоков в открытые водоемы не предусмотрен.

Принятое пожаротушение на предприятии

На предприятии для внутреннего пожаротушения предполагается установка пенных и порошковых огнетушителей.

Для наружного пожаротушения предприятия предусмотрены кольцевые сети $d = 150$ мм с установкой пожарных гидрантов в количестве 2 шт, подключение которых осуществляется к сети централизованного водопровода. Ливневые воды собираются и сбрасываются в ирригационную систему. Сброс в открытый водоём отсутствует.

4.3 Сведения об отходах производства и пути их утилизации

На рассматриваемом участке будут образовываться отходы производства и потребления.

В процессе работы предприятия происходит образование следующих видов отходов: отходы макулатуры и полиэтиленовой тары из-под упаковок фар

Отходы отработанных бактерицидных ртутных ламп

Бактерицидные газоразрядные ртутные лампы используются для обеззараживания лабораторных помещений предприятия. Бактерицидная лампа – электрическая ртутная газоразрядная лампа низкого давления с колбой из увиолевого стекла или другого материала, обеспечивающего заданный спектр пропускания ультрафиолетового излучения. Ультрафиолетовое излучение обладает обеззараживающими свойствами, которые и дали название лампе.

Данные об образовании отработанных бактерицидных ламп получены расчетным методом. На участках будет 5 ед. бактерицидных излучателей.

Согласно сертификата, ресурс работы одной бактерицидной лампы – 9000 часов. Среднее время эксплуатации ламп – 1 час в сутки, 330 рабочих дней в году. Тогда, среднее время службы одной лампы составит:

$$9000 / 1 = 9000 \text{ дней}$$

Норматив списания бактерицидных ламп, пришедших в негодность, составит: $330/9000 = 0,0367$

Тогда количество бактерицидных ламп, вышедших из строя за год, составит: $5 \cdot 0,0368 \approx 1$ шт.

Средний вес образования отхода отработанных бактерицидных ртутных ламп, при среднем весе лампы около 320 граммов, составит: $1 \cdot 320 \cdot 10^{-6} = 0,00032$ тн.

По мере образования лампы хранятся в индивидуальной картонной гофрированной коробке, обеспечивающий сохранность ламп и складываются в специальные ящики, на территории специального склада с последующей сдачей

для утилизации АСП «СЭЛТА». Согласно Классификационному каталогу отходу присвоен 1 класс опасности.

Отработанные светодиодные лампы

Светодиодные лампы используются для освещения производственных помещений и двора.

Данные об образовании отработанных светодиодных ламп получены расчетным методом. На предприятии будет установлено около 500 штук ламп разной мощности.

Согласно сертификату, ресурс работы одной светодиодной лампы – 40000 часов.

Среднее время эксплуатации ламп – 8 часов в сутки 330 рабочих дней в году. Таким образом, среднее время службы одной лампы типа ЛБ составит: $40000 / 8 = 5000$ дней

Норматив списания люминесцентных ламп, пришедших в негодность, составит: $330 / 5000 = 0,066$

Тогда количество светодиодных ламп, вышедших из строя за год будет равно: $500 * 0,066 = 33$ шт.

Вес одной лампы 100 граммов. При этом количество отхода составит: $33 * 100 * 10^{-6} = 0,0033$ т/год.

Отработанные светодиодные лампы относятся к 4 классу опасности и подлежат вывозу вместе с мусором на полигон бытовых отходов.

Отходы макулатуры

Отходы макулатуры образуются от офисной деятельности предприятия. Ориентировочное количество образования бумажных отходов составит до 50 кг/год. Количество отхода составит 0,05 тн/год.

Весь отход сдается на пункты «Вторсырья». Отход относится к 5 классу опасности.

Отходы использованных испорченных образцов согласно данных предприятия, в год ожидается образование до 1,5 кг отходов использованных испорченных образцов, которые согласно процедурным документам передают специализированным организациям. Количество отхода составит 0,0015 тн/год. Отход относится к 4 классу опасности.

Пищевые отходы

На предприятии организован участок столовой на 40 посадочных мест. Норма образования пищевых отходов с одного условного блюда составляет 0,03 кг/год. Всего планируется организовать горячее питание до 80 условных блюд в день, режим работы предприятия 330 дней/год. Тогда, количество отхода составит:

$$80 * 300 * 0,03 / 1000 = 0,72 \text{ тн/год.}$$

Отходы пищи по мере образования собираются в специальных пластиковых емкостях, установленных на участке кухни столовой предприятия

и ежедневно передают близпроживающему населению на корм домашним животным. Согласно Классификационному каталогу отходу присвоен 5 класс опасности.

Образование непромышленных отходов

Отходы определены согласно СанПиН РУз 0297-11 «Санитарные правила и нормы очистки территорий населенных мест от твердых бытовых отходов в условиях Республики Узбекистан».

Коммунальные отходы в виде твердых бытовых отходов

Количественный состав персонала предприятия составляет 38 человек. Годовая норма образования отходов на одного человека – 50 кг.

За год образование коммунальных отходов в виде твердых бытовых отходов составляет - $38 \cdot 50 / 1000 = 1,9$ тонн в год.

Коммунальные отходы в виде отходов от уборки территории с твёрдым покрытием

Площадь территории с твердым покрытием на предприятии равна – 3526,8 м². Годовая норма образования отходов с одного квадратного метра площади с твердым покрытием – 5,5 кг.

Норматив образования коммунальных отходов в виде отходов от уборки территории с твердым покрытием составляет – $5,5 \cdot 3526,8 / 1000 = 19,3974$ тонн в год.

Коммунальные отходы в виде отходов от уборки территории с грунтовым покрытием

Площадь территории с грунтовым покрытием (зеленых насаждений) на предприятии равна – 11900 м². Площадь территории с грунтовым покрытием, подлежащая уборке составит около 6000 м². Годовая норма образования отходов с одного квадратного метра площади с грунтовым покрытием – 11,2 кг.

Норматив образования коммунальных отходов в виде отходов от уборки территории с грунтовым покрытием составляет – $11,2 \cdot 6000 / 1000 = 67,2$ тонн в год. Всего коммунальных отходов образуется

Всего количество ТБО составит: $1,9 + 19,3974 + 67,2 = 88,4974$ т/год.

Отходы централизованно регулярно вывозятся с территории предприятия на горсвалку. Отход относится к 4 классу опасности.

4.4 Проектируемое предприятие, как источник привноса в окружающую среду шума и вибраций

На рассматриваемом производственном объекте источником возникновения шума будет являться автотранспорт, ввозящий и вывозящий сотрудников и Заказчиков.

При эксплуатации данной территории шумовой фон превышать не будет.

5. Аварийные ситуации и мероприятия по их предотвращению

С целью оценки потенциальной экологической опасности предприятия, связанной с аварийными ситуациями, рассмотрены возможные сценарии, а также последствия этих аварий.

Из анализа технологических процессов предприятия и в силу того, что все технологическое оборудование работает от источников тока, можно предположить, что аварийные ситуации на организуемом предприятии могут возникнуть от электрического тока, а именно:

- короткого замыкания в кабельных линиях или от перегрузок;
- короткого замыкания в оболочках двигателей и электрических аппаратах;
- перегрузки электрических машин и аппаратов;
- перегрева отдельных частей электрических машин, вызванного большим переходным сопротивлением в электрической сети.

На основании выше изложенного можно предположить, что наиболее вероятной аварией может быть авария, развивающаяся по сценарию пожар.

Для предотвращения возникновения пожаров от неисправностей в электросети предусматриваются следующие меры:

- блокировка электрических схем управления технологическими установками и механизмами;
- надежное заземление всех элементов электрооборудования, которые могут оказаться под напряжением при нарушении изоляции;
- вся защитная аппаратура и кабели выбраны по допустимому нагреву и сверены по перегрузочной способности при токах короткого замыкания.

С целью локализации пожаров в помещениях основного корпуса, а также в складских помещениях предусмотрена пожарная сигнализация, а также средства пожаротушения – пенные огнетушители, песок, противопожарные гидранты, соединенные с емкостью хранения противопожарного запаса воды.

Основными путями предотвращения аварийных ситуаций является соблюдение требуемого противопожарного режима и своевременное выполнение противопожарных мероприятий и предписаний Государственного пожарного надзора.

Основными путями предотвращения аварийных ситуаций является соблюдение технологических режимов производства.

6. Мероприятия по предупреждению неблагоприятных воздействий на окружающую среду

Неблагоприятное воздействие на окружающую среду от территории УСЭБиОЗ г. Ташкента может оказаться только при аварийных ситуациях.

Для предупреждения такого типа аварийных ситуаций следует строго соблюдать правила противопожарной безопасности, следить за исправностью электрических приборов, вентиляционной системой.

Необходимо также установить систему пожарной сигнализации в помещениях.

С целью снижения шумового воздействия предусматривается произвести посадку деревьев декоративных пород по всему периметру границы предприятия.

Для предупреждения аварийных ситуаций следить за исправностью контрольно-измерительных приборов.

Для снижения вероятности негативных экологических последствий от возможных аварий на рассматриваемом объекте предусматриваются все требуемые меры пожарной безопасности, безаварийной эксплуатации технологических и энергоустановок, а также мероприятия по защите поверхностных и подземных вод от загрязнения неочищенными сточными водами.

7. Прогноз возможных изменений окружающей среды, как результат выявленных воздействий

По результатам машинного расчета можно сделать выводы, что за границей рассматриваемого предприятия не наблюдается превышение предельно допустимых концентраций и установленных квот не по одному из выбрасываемых ингредиентов.

Источниками шума на рассматриваемом предприятии является автотранспорт, подвозящий и вывозящий сотрудников и сертифицируемую продукцию. При соблюдении правил эксплуатации и применении шумопоглощающих мероприятий, увеличение шумового фона в районе размещения предприятия не ожидается.

Вода на предприятии будет использоваться на хозяйственно бытовые нужды. Обеспечение водой для хоз-бытовых нужд будет осуществляться с горводопровода. Сброс сточных вод хоз-бытового характера будет производиться в систему горканализации. Производственных стоков не образуется.

В процессе деятельности предприятия происходит образование производственных и побочных отходов.

Большая часть производственных отходов является деловыми и подлежит утилизации и переработке.

Бытовой мусор от жизнедеятельности сотрудников участка складывается в металлических контейнерах на специально отведенной забетонированной площадке. Количество мусора образующегося за период производственного года

складывалось из отходов, образующихся в результате жизнедеятельности обслуживающего персонала, уборки территории.

В рамках рабочего проекта предприятия решены вопросы утилизации отходов.

Для снижения вероятности негативных экологических последствий от возможных аварий на рассматриваемом объекте предусмотрены все требуемые меры пожарной безопасности, безаварийной эксплуатации технологических и энергоустановок, а также мероприятия по защите поверхностных и подземных вод от загрязнения неочищенными сточными водами.

Прогноз воздействия организуемого производства на воздух, поверхностные и грунтовые воды, почву – благоприятный.

Заключение

Оценка воздействия при организации и функционировании производственного участка УСЭБиОЗ г. Ташкента располагающегося на собственной территории в Алмазарском районе города Ташкента проведена на основе анализа существующего состояния окружающей среды, социально-экономических аспектов и технологических решений.

В работе дана характеристика видов воздействия, определяющихся привнесом в окружающую среду химических веществ, акустических шумов, составлен прогноз изменения окружающей среды, как результат выявленных воздействий.

Строительство дополнительного здания и установка дополнительного отопительных агрегатов приведет к увеличению количества выбросов в окружающую среду данного района на 3,11225 т/год.

Вода будет использоваться из централизованного водопровода на хозяйственно бытовые нужды. Образованные хоз-бытовые стоки будут сбрасываться в систему горканализации.

Отходы, образующиеся при работе предприятия составят 89,27252 тн/год, из которых ТБО составляет 88,4974 тн/год. Часть отходов в виде отходов макулатуры подлежит сдаче на пункты «Вторсырья». ТБО централизованно вывозится на горсвалку.

В случае возникновения пожара в помещениях участка будут использоваться все известные средства пожаротушения.

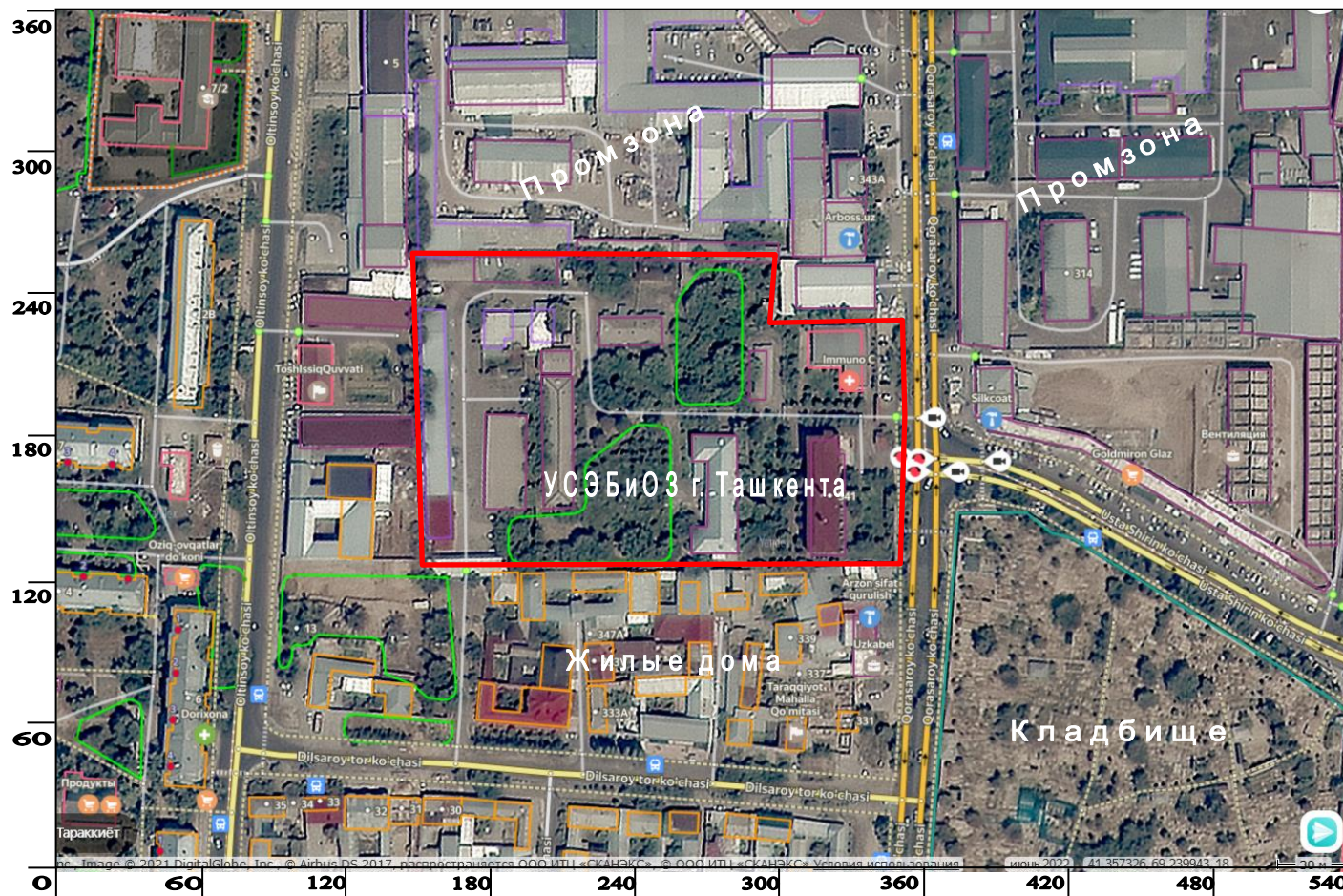
На основании выше изложенного можно сделать вывод о том, что эксплуатация объекта в силу предусмотренных природоохранных мероприятий не приведет к ощутимому его отрицательному воздействию на окружающую среду, что делает объект экологически безопасным и допускает его размещение на территории Алмазарского района г. Ташкента.

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Масштаб 1:3000



Руководитель предприятия _____

Государственный инспектор _____

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