



ENVIRONMENTAL MITIGATION AND MONITORING PLAN (EMMP)

PROJECT/ACTIVITY DATA

Project/Activity Name:	USAID's Sustainable Water and Sanitation Systems Activity
Geographic Location(s) (Country/Region):	Democratic Republic of Congo, North and South Kivu
Implementation Start/End Dates:	Sept. 30, 2020- Sept. 29, 2025
Contract/Award Number:	72066020CA00004
Implementing Partner(s):	Mercy Corps, London School of Economics, Sanergy, Tetra Tech
Tracking ID:	
Tracking ID/link of Related IEE:	DRC WASH IEE – June 2021
Tracking ID/link of Other, Related Analyses:	

ORGANIZATIONAL/ADMINISTRATIVE DATA

Implementing Operating Unit(s): (e.g. Mission or Bureau or Office)	USAID Mission in DRC
Lead BEO Bureau:	
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Date Submitted:	

ENVIRONMENTAL COMPLIANCE REVIEW DATA

Analysis Type:	EMMP
Additional Analyses/Reporting Required:	EMMR

ACRONYMS

ACE	l'Agence Congolaise de l'Environnement
AFR	Bureau for Africa
AOR	Agreement Officer's Representative
BEO	Bureau Environmental Officer
BPR	Best Practice Review
CLA	Collaborating, Learning and Adapting
CoP	Chief of Party
COR	Contracting Officer's Representative
CRM	Climate Risk Management
DRC	Democratic Republic of Congo
EA	Environmental Assessment
EMMP	Environment Mitigation and Monitoring Plan
EMMR	Environmental Mitigation and Monitoring Reports
ERF	Environmental Review Form
ERR	Environmental Review Report
IEE	Initial Environmental Examination
M&E	Monitoring and Evaluation
MEL	Monitoring, Evaluation and Learning
MEO	Mission Environmental Officer
MSD	Market Systems Development
NDwC	Negative Determination with Conditions
O&M	Operation and Maintenance
PPP	Public-Private Partnerships
REA	Regional Environmental Advisor
SRG	Stakeholder Relations and Governance
SWASSA	Sustainable Water and Sanitation Systems Activity
TBD	To Be Determined
USAID	United States Agency for International Development
USG	US Government
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WHO	World Health Organization
WQAP	Water Quality Assurance Plan

PURPOSE

Environmental Mitigation and Monitoring Plans (EMMPs) and Climate Risk Management (CRM) screening matrix are required for USAID-funded projects, as specified in ADS 204, when the 22 CFR 216 documentation governing the project (e.g., the Initial Environmental Examination (IEE)) specifies mitigation measures are needed. EMMPs are an important tool for translating applicable IEE conditions and mitigation measures into specific, implementable, and verifiable actions.

An EMMP is an action plan that clearly defines:

1. **Mitigation measures.** Actions that reduce or eliminate potential negative environmental impacts resulting directly or indirectly from a particular project or activity, including environmental limiting factors that constrain development.
2. **Monitoring indicators.**¹ Criteria that demonstrate whether mitigation measures are suitable and implemented effectively.
3. **Monitoring/reporting frequency.** Timeframes for appropriately monitoring the effectiveness of each specific action.
4. **Responsible parties.** Appropriate, knowledgeable positions assigned to each specific action.
5. **Field Monitoring/Issues.** Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution. This field is primarily for documentation during implementation.

The EMMP is a living document. It will be reviewed against the IEE and updated/tailored as needed over the life of implementation, e.g., when new sites are identified or changes in scope are made through award modifications and IEE Amendments. The EMMP and CRM matrix will be reviewed and updated on an annual basis and submitted with the project's annual work plans.

ACTIVITY SPECIFIC AND LOCATION SPECIFIC EMMP

This EMMP represents the Programme Level for the whole activity. Given that specific locations are not yet finalized, it is not possible to develop Section 4 EMMP Table for USAID's Sustainable Water and Sanitation Systems Activity to be site specific. For this reason, a Zone level EMMP will be prepared with specific requirements relating to the Intervention Zone, e.g., specific scoping or environmental assessment study needs and mitigations detailed.

1.0 PROJECT/ACTIVITY SUMMARY

USAID's Sustainable Water and Sanitation Systems Activity (the Activity) is a five-year \$32 million program, implemented by Mercy Corps, London School of Economics and Political Science

¹ Note: Monitoring indicators differ from performance indicators, which are the measures that USAID uses to detect progress towards the results included in a Results Framework.

(LSE), Sanergy, and Tetra Tech. The Activity aims to create sustainable and equitable access to clean water supply and safe sanitation services through a developed market sector in the Kivus region.

The Activity Theory of Change posits that ***IF an improved understanding of the impact and scalability of the water and sanitation sectors is established, and IF an improved enabling environment for investment in the water and sanitation sector exists, and IF market potential of implemented models of economically sustainable delivery of water and sanitation is proven, THEN a developed market sector will allow communities in the Kivus region to have sustainable and equitable access to clean water supply and safe sanitation services.*** This is brought to life through the integration of three main objectives, with a cross cutting focus on gender and youth as well as collaborating, learning and adapting (CLA):

Objective 1: Improved understanding of the impact and scalability of the water and sanitation sectors in the Kivus region is focused on ensuring that implementation is accompanied by robust learning, including comparability across models and effective distribution of those learnings to facilitate better informed decision-making among WATSAN service providers. The goal of this research is to de-risk investment and encourage the private sector/social enterprises to take the models to scale or replicate elsewhere. In addition, information about the impact sustainable WATSAN business model(s) have on the lives of the citizens living in target communities – in particular, marginalized women and youth – will be shared with wider audiences.

Objective 2: Improved enabling environment for investment in the water and sanitation sector in the Kivus region is concerned with facilitating an improved enabling environment for investments in the WATSAN sector in DRC. Informed by USAID’s objective to strengthen local governance systems, the Activity will ensure that state-partners have the skills necessary to effectively attract and oversee performance-based contracts through monitoring of key performance indicators. It will also foster management that is responsive and accountable to the demands of empowered citizens. Linked activities will also help facilitate relationships between supply chain providers, potential investors, operators, and authorities, as well as increasing their capacity by improving business practices including commonly accepted standards for accounting, procurement, and human resource management.

Objective 3: Market potential is proven through implemented models of economically sustainable delivery of water and sanitation for communities in the Kivus region will use the opportunities afforded by the regulatory environment to implement, refine, and expand existing and new models for performance-based water system management while also working to put in place a viable cost-recoverable sanitation business model suited to the realities of the context of the Kivus. Small infrastructure investments, designed according to cost-benefit and participatory criteria, will reinforce the business models to be implemented.

The EMMP for the Sustainable Water and Sanitation Systems Activity is based on the threshold determination and summary of finding in the DRC WASH Initial Environmental Examination (IEE) approved on June 21, 2021. The IEE organized the Activity’s interventions using the following Intervention Categories:

- **Intervention Category 1:** Conduct applied research and baseline assessments of water and sanitation (WATSAN) services
- **Intervention Category 2:** Develop and test peri-urban water and sanitation (WATSAN) business models and contractual mechanisms
- **Intervention Category 3:** Support Access to Financing for Water and Sanitation
- **Intervention Category 4:** Rehabilitation and Expansion of WATSAN infrastructure in peri-urban areas
- **Intervention Category 5:** Training, capacity building and community engagement

The determinations given in the IEE for the Activity’s Intervention Categories include: Categorical Exclusion Citation, Negative Determination with Conditions (NDwC), and Positive Determination. The climate risk management (CRM) assessment for the relevant activities is documented in the IEE (section 4.2 and Annex). The analysis is based on the USAID Climate Risk Screening and Management Tool for Project Design ([U.S. Climate Resilience Toolkit](#)).

The Bureau Environmental Officer (BEO) approval of the EMMP includes the following specified condition:

- Implement environmental monitoring requirements. This includes development and alignment of Environmental Mitigation and Monitoring Plan (EMMP) with performance M&E systems.
- Support the Mission in the development of any Best Practice Review (BPR) for environmental safeguarding.
- Ensure compliance with partner country environmental regulations.

The AFR BEO requests that the AOR provide access to the Regional Environmental Advisor (REA) and to the AFR BEO Team to review (not approve) the Environmental Mitigation and Monitoring Plans/Reports (EMMPs/EMMRs) that will be written to implement the findings of this IEE. These will be uploaded into the appropriate sub-folder(s) of [Mercy Corps Activity Shared Drive Folder](#) with a mirror folder to USAID. This will facilitate access by all parties who need these documents, including the Mission Environmental Officer and the AOR/COR. This will allow the REA and the BEO Team to spot-check and review these documents to confirm that the mitigations seem appropriate and are cognizant of the specific design of the activities.

The negative determinations recommended in this IEE are contingent on full implementation of specified conditions and a set of general monitoring and implementation requirements specified in this “BEO Conditions” section as well as Section 5 of the IEE. Some specific conditions to highlight include:

WQAP Condition: As there are WASH activities covered under this IEE, the AFR BEO requires that a project-level water quality assurance plan (WQAP) is prepared according to the [WQAP Template](#):

- Complete a WQAP for WASH-related activities under this IEE, and request and receive AFR BEO review and approval of WQAP.
- Clearly link the WQAP to this IEE.

- The review results should be written and on record in the Signing Statement of the WQAP.

The WQAP will be prepared in consultation with the cognizant AOR. Its purpose is to ensure that all new and rehabilitated USAID-funded sources of drinking water provide water that is safe for human consumption. The completed WQAP must be approved by the AOR; the MEO; and the REA.

- Once approved, the WQAP must be implemented in full, and for the duration of drinking water activities. Implementation must include testing of water prior to making the supply point available to partners.
- The WQAP constitutes a key element of the project's EMMP. The approved WQAP will include at minimum the following sections: 1) Project information (name of project, name of IP, period of performance, contact information, name of AOR), 2) A description of the drinking water points to be subject to the WQAP (approximate numbers, water source(s), technology (ies), general geographic area and installation context), 3) An inventory of applicable water quality standards, including those promulgated by USAID, as well as the cognizant host-country regulatory entity/entities. (The World Health Organization [WHO] Guidelines for Drinking-water Quality may be substituted for host-country standards that are not accessible, unclear, or outdated.)
- The responsible parties/entities/institutions, under host country law or policy, for monitoring and managing water quality of the water points subject to this WQAP. If other than the IP, a summary assessment of their capacity and their involvement.
- A technical assessment of the equipment, resources and expertise that will be required to monitor and report on compliance with applicable water quality standards. This should include, for example, sampling materials, reagents, transportation, storage, laboratory facilities and capacity, communications, training, or certification criteria, etc.
- Protocol for initial testing and ongoing monitoring of water quality, to include:
 - contaminants for which initial testing and ongoing monitoring will be conducted
 - water quality assessment methods, including test type and frequency
 - data management and reporting; the project must maintain a central registry of monitoring results by water point and date; GPS coordinates for water points are expected
 - Justification for NOT testing to any applicable standard
 - Sustainability strategy to the extent that responsibility for longer-term water quality assurance will transition in part or whole to project partners or beneficiaries. A summary assessment of the capacity of these partners, and any capacity building to be undertaken
- The WQAP should follow any applicable USAID guidance, as well as local laws, regulations, and policies

COVID-19 Condition: To reduce COVID-19 transmission during the implementation of these activities, the EMMP must:

- Ensure all activities addressed by this IEE adhere to current, applicable COVID-19 guidelines. Refer to the [AFR COVID-19 PIEE](#) for links to U.S. and international guidance on appropriate measures to reduce COVID-19 transmission. Such measures may include, but are not limited to social distancing, use of personal protective equipment, limiting the size of gatherings and travel, and effective disinfection.

Construction Condition: NDwC for construction of new or rehabilitated facilities in which the total surface area disturbed is 1000 m²) or less and there are no complicating factors, as defined:

- No complicating factors. The site:
 - is not within 30m of a permanent or seasonal stream or water body,
 - will not involve displacement of existing settlement/inhabitants,
 - has an average slope of less than 5%,
 - is not heavily forested or not in an otherwise undisturbed local ecosystem, and
 - is not in a protected area.
 - Sites violating one or more of these criteria are subject to additional determinations and conditions.
- Construction sites bigger than 1,000 m² or more than \$250,000 requires the A/COR and MEO to jointly consult with the AFR BEO for next steps. No implementation is allowed until the AFR BEO conditions are fully met.

2.0 SITE SPECIFIC INFORMATION

This EMMP details the site information for North and South Kivu.

Eastern DRC, in particular North and South Kivu, has been an active conflict zone on and off since 1996 and is driven in large part by competition over natural resources such as timber, diamonds, and petroleum. In addition, traditional ethnic hostilities have been exacerbated by an influx of small arms into the area. Further, lack of economic opportunity attracts youth to armed forces and local militias that have become criminal gangs. The Peace, Security, and Cooperation Framework for the DRC, signed in Addis Ababa in 2013, is a promising sign that peace prospects are more likely, but many previous peace agreements have been implemented with no lasting impact, and the conflict continues. The Government of the DRC negotiated a ceasefire with the M23 rebel group in 2013 and retook control of Goma, but more than 40 other armed groups still operate in the region. Transitioning to a stable democracy will be a challenge in a country where political processes are often considered untrustworthy, non-inclusive, and lacking leadership. For example, despite gains in women's rights, women's attendance at peace negotiations has been inadequate, and they have a very limited role in decision making.

Specific sub-locations for the first implementation sites will start to be identified in the final quarter of Year 1, while the second phase of implementation sites will be identified in Year 2. When they are identified, should the environmental conditions differ from the provincial data detailed below, the EMMP will be updated accordingly. Generally, specific site environmental

considerations will reflect construction activities and mitigation requirements and will be included in the construction management plans produced for each working area and the specific EMMP identifies for each area

In North and South Kivu, the mountainous topography and abundant supply of rainfall mean that the majority of small-scale water systems are gravity fed and spring sourced. However, the prevailing geology in many peri-urban areas throughout North Kivu, as well as Goma, mean that despite abundant rainfall, there is often very little available surface water. In Goma, water is disinfected and fed by a gravity distribution line across the peri-urban northern suburbs to a network of 53 tap-stands that reaches around 270,000 people daily. Nevertheless, service coverage remains less than optimal with waiting times of more than 4 hours during peak dry seasons. Coverage in western parts of Goma is almost negligible, with the market being filled by bicycle water couriers selling lake-water of dubious quality. In Bukavu in South Kivu, the soil is less porous, and peri-urban areas are partially served by a mixed network of gravity fed spring and river sourced water systems in addition to small-scale pumping from the lake for certain neighborhoods. However, similarly to Goma, coverage is negligible or patchy in peri-urban areas. In both cities and their peri-urban surroundings, REGIDESO has had a poor track record in the management of an investments in network maintenance, renewal, and extension – with assets installed via donor funding being run into the ground to the point of becoming dysfunctional and almost redundant in terms of the purpose it is intended to serve.

Climate change poses an additional threat to the ecosystems and people of the DRC, who have already been challenged by years of conflict, poverty, and environmental degradation. Almost 90 percent of the population depends on rain-fed agriculture. Rising temperatures are expected to cause an increase in crop diseases, such as cassava mosaic virus, and droughts that will disrupt both food and cash crops. Climate stimulations also predict floods, landslides, and soil erosion, especially in the Congo Basin. Malaria and water-borne diseases are expected to become more widespread and water stress will become more acute, leading to indirect effects on DRC’s energy supply, which is mostly derived from hydroelectric power. Mangroves are especially vulnerable due to their unique biodiversity and have already seen degradation by coastal erosion in the mangrove Marine Park in Moanda.

Overall, the highest-rated risks for climate change impacts on WATSAN infrastructure and services are risks to water supply, quality, and demand, as well as risks to infrastructure. Changes to temperature, dry spells, and seasonal flows may decrease water supplies, affect expected timing of supplies, increase water demand, and reduce water quality. Increased intensity and frequency of rainfall and flooding could also damage WATSAN infrastructure or disrupt operations and services. Annex 1 includes the results of climate risk screening from the IEE, which identified climate risk and opportunities to adapt and/ or mitigate these risks during the life of each activity.

Environmental Baseline Information Table for Possible Activity Intervention Zones (to date):

Prov	Intervention area	Location	Av. Elevation	Topography	Vegetation	Average Rainfall per Year	Rainy Season

North Kivu	Bweremana	2°41.502'S, 29°0.955'E	1532m	Mountainous	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December
	Shasha	1°37.390'S, 29°0.971'E	1486m	Mountainous	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December
	Kirtotshe	1°36.762'S, 29°1.844'E	1486m	Mountainous	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December
	Sake	1°34.469'S, 29°3.866'E	1568m	Mountainous	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December
	Mugunga	1°36.682'S, 29°9.204'E	1530m	Relatively Flat	Grasses- savannah mosaics	1,570mm	March-May & September- December
	Lac Vert	1°37.512'S, 29°9.532'E	1480m	Relatively Flat with some elevated points	Grasses- savannah mosaics	1,570mm	March-May & September- December
South Kivu	Katana	2°13.206'S, 28°49.745' E	1632m	Hilly	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December
	Kavumu	2°17.950'S, 28°47.88'E	1780m	Hilly	Woodlands, grasses, savannah mosaics	1,570mm	March-May & September- December

Further details regarding the specific sites are included in the specific EMMP. Periodically the EMMP will be updated to reflect new site locations as selected by the Activity.

Ecological Conditions: North and South Kivu lie on the equator, with a climate that is dominated by the Intertropical Convergence Zone.² A central feature of the region is Lake Kivu, a sub-basin of the Lake Tanganyika Basin, which is in turn a sub-basin of the Congo River Basin.³ The lake's surface temperature varies between 22 and 34 degrees (C). The basin is characterized by a great range of vegetation cover, from grasses interspersed with trees, deciduous forest, savannah mosaics and woodland in some areas, all highly susceptible to changes in land use. The conversion of land for agricultural use, deforestation for charcoal, etc., has exacerbated soil erosion and pollution with runoff to Lake Kivu.⁴ Both regions are projected to see changes in temperature and precipitation as a result of climate change. Between 1975-2050, mean temperature is anticipated to increase by 2.5 degrees (C). In the same period, annual total precipitation is expected to increase as high as 6%.⁵ These increases are matched by a decrease in the predictability of annual rains, with intermittent patterns and increased severe weather events. Intense rainfall after prolonged dry spells is a contributing factor for erosion and flash flooding, crop damage, and population health risks.⁶

Rainfall and Water Access: The overarching topography is mountainous and marked by an abundant supply of rainfall, with averages up to 1,570mm of rainfall per year.⁷ The area was historically marked by two distinct rainy seasons (March-May and September-December); nonetheless, climate change has increased variability of rains, with irregular seasons now common. Despite the abundant rainfall, access to water remains an issue. 50% of the population has access to an improved drinking source.⁸ At a national level, nearly 47% of country's internal renewable water resources consist of groundwater, typically accessed via dug wells.⁹ However, for many peri-urban areas throughout North Kivu, the prevailing geology is porous volcanic rock. The region hosts Mount Nyiragongo, an active stratovolcano in the DR Congo, about 20 km north of Lake Kivu. Nyiragongo and nearby Nyamuragira are together responsible for 40% of Africa's historical volcanic eruptions.¹⁰ As a result of the volcanic rock, there is often very little available surface water or groundwater. In Goma in particular, aside from Lake Kivu, there are no perennial surface water bodies in the immediate vicinity of the city capable of supplying its growing population. Within the city of Bukavu in South Kivu, the soil is less porous, and there is a presence of spring and river sourced water, specifically the Kauwa River, Mukukwe River, and Ruzizi River in addition to the lake. The extreme weather events, noted above in the ecological profile, also pose a risk for these water sources, as frequent rainfall can increase the risk of flooding in rivers, streams, with the potential to impact water quality, particularly in urban zones.

² Government of the Netherlands, Ministry of Foreign Affairs. Climate Change Profile, DRC (East), 2018

³ Global Environment Facility, Lake Kivu and Rusizi River Basin Water Quality Management Project Summary, 2020

⁴ Global Environment Facility, Lake Kivu and Rusizi River Basin Water Quality Management Project Summary, 2020

⁵ Government of the Netherlands, Ministry of Foreign Affairs. Climate Change Profile, DRC (East), 2018

⁶ USAID, Climate Risk Profile, DRC, 2018

⁷ Beyene T., Ludwig F., Franssen W. (2013): The potential consequences of climate change in the hydrology regime of the Congo River Basin. In: Climate Change Scenarios for the Congo Basin. [Haensler A., Jacob D., Kabat P., Ludwig F. (eds.)]. Climate Service Centre Report No. 11, Hamburg, Germany, ISSN: 2192-4058.

⁸ Demographic Health Survey, 2013-2014

⁹ USAID, Climate Risk Profile, DRC, 2018

¹⁰ Global Environment Facility, Lake Kivu and Rusizi River Basin Water Quality Management Project Summary, 2020

Sanitation: Only 18% of the population nationally has access to improved sanitation, a situation that is echoed in the Kivus.¹¹ Rapid population growth in the Bukavu and Goma has overwhelmed what available sanitation resources were present and the cities are largely unable to provide basic sanitation services, in part due to a lack of urban planning associated with this growth and noncompliance with building regulations.¹² The cities lack a comprehensive sanitation system or central sewer system to evacuate, store and treat fecal matter. Further, the volcanic soil that characterizes the region makes it difficult to dig holes and install appropriate fecal sludge containment; additionally, construction of a sewer system in Goma is impractical and prohibitively expensive. In Bukavu, the central part of the city relies on a centralized sewer network that is connected to non-functional wastewater treatment plants while in other areas there is no system. Household level sanitation systems vary widely by socio-economic status, with the wealthiest using flush systems connected to private septic tanks and the poorest communities relying on rudimentary latrines with open drains that are rarely emptied. Poorly managed fecal waste in urban and peri-urban areas contaminates open sources of water, including significant runoff into Lake Kivu. Additionally, the increased frequency of extreme weather events, particularly intense rains, and associated flooding, can further increase the risks for water contamination in urban and peri-urban zones, as the excessive rains can carry above the open sewage, rubbish, and other waste to water sources. It's unclear the full volume of fecal waste entering Lake Kivu, making contamination estimates difficult. However, a microbiological purity study completed in 2010 around Goma and Gisenyi found that the number of fecal bacteria found in the water exceeded the limits recommended by the WHO.¹³ With the growth of both cities, the situation is likely to have deteriorated further.

All project activities will be implemented in conjunction with the appropriate institutions to comply with the following governing laws:

1. Third Republic Constitution, Art. 53, 123 and 203
2. Basic Fundamental Principles Relating to Environmental Protection (Law No.11/009), chapter 5 and 6
3. DRC's Water Law (15/026) and Policy (2015-2016)

The Activity will follow the environmental review and permitting process with *l'Agence Congolaise de l'Environnement (ACE)*. The process will be developed under the site specific EMMPs as different sites may have different environmental requirements based on scope and scale. Subsequent updates will be reflected in this section.

3.0 ANNUAL REPORTING

Annually, the Implementing Partner will prepare an Environmental Mitigation and Monitoring Report (EMMR) to be submitted to the Activity Manager/AOR/COR and the USAID [Environmental Compliance Database](#). This report will summarize the effectiveness of mitigation measures, issues encountered, resolutions, and lessons learned. As appropriate, attachments

¹¹ Demographic Health Survey, 2013-2014

¹² Oguna, M. "Shit Flow Diagram Narrative Reports- Goma and Bukavu" 2019, Mercy Corps

¹³ Olapade, O.J. and Omitoyin, B.O. (2010) Microbiological index of water pollution in Lake Kivu, Rwanda. In: 25th Annual Conference of the Fisheries Society of Nigeria (FISON), 25-29 Oct 2010, Lagos, Nigeria, 220- 225

such as site photos, verification of local inspections, product warranties, etc. should also be included. Given that new sites will be selected each year as part of the program, the annual report will include specific detail on the site-specific conditions.

The Chief of Party is ultimately responsible for the implementation of the EMMP, however, day to day oversight will be led by an Environmental Coordinator (for legislative and process mapping and environmental safeguarding measures reporting directly to the CoP and two Environment, Health, and Safety Engineers under the leadership of the Infrastructure Performance and Delivery Manager. One Environment, Health and Safety Engineer will be placed in each province. Monitoring associated with the EMMP actions are tracked by the MEL Director, and including in reflection sessions for early identification and resolution of any challenges.

4.0 EMMP TABLE FOR USAID’S SUSTAINABLE WATER AND SANITATION SYSTEMS ACTIVITY

The EMMP table below identifies tasks from the Programme Description that are considered moderate environmental risks and have a Negative Determination with Conditions according to the DRC WASH IEE approved on June 21, 2021. Subcategory 4.2 in the IEE indicates that that the Sustainable Water and Sanitation Systems Activity may include activities with Positive Determination. These activities fall under Subcategory 4.2: Large-Scale Water and Sanitation Infrastructure Rehabilitation and Construction, or Small-scale Rehabilitation and Construction in the presence of complicating factors. If a Positive Determination threshold is made, the AOR will ensure a Scoping Statement, and if required an Environmental Assessment (EA), is completed and approved by the BEO before the subject activities are implemented.

Although some tasks from the Programme Description are recommended for Categorical Exclusion pursuant to the appropriate Reg. 216 citations and are, thus, excluded from further environmental review, the presence of COVID-19 - a highly infectious, high-consequence disease, could impact human health, particularly during in-person consultations, meetings, and stakeholder engagement. The Activity will adhere to current, applicable COVID-19 guidelines when implementing these tasks. Such measures may include, but are not limited to social distancing, use of personal protective equipment, limiting the size of gatherings and travel, and effective disinfection.

Activity descriptions pertaining to infrastructure construction and rehabilitation and their subsequent analysis of impacts and mitigation measures, are considered DEFERRED and not analyzed. Prior to infrastructure construction and rehabilitation, a Zone level EMMP (Intervention Zone or site-specific EMMP) to the will be submitted to USAID for review and approval in conjunction with the Year 3 Annual Construction Plan. The Activity Level EMMP will be updated, as necessary.

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
Category 1: Conduct applied research and baseline assessments of water and sanitation (WATSAN) services.						
Subcategory 1.1: Conduct needs assessments and/or political economy analyses for WATSAN, complete gap analysis and identify possible	Presence of COVID-19 - a highly infectious, high-consequence disease, could impact human health, particularly during in-person	Negative Determination subject to the following conditions: The Activity will adhere to current, applicable	Identification of any COVID-19 positive situations. MEL team to monitor measures as per the	At same frequency as defined in Line with the MEL Monitoring Plan	All Activity management and administrative staff; Activity technical staff. MEL Manager and MEL	The global COVID-19 pandemic continues as of the writing of this EMMP. Therefore, mitigation measures will remain in place until further notice.

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>solutions to address market deficiencies. This includes the following activities: <i>mapping existing evidence base and identifying gaps in WASH (1.1.1); implementing research and learning strategy (1.1.2); amplifying voices of underrepresented communities and research institutions in research process (1.1.3); mapping the communications landscape (1.2.1); and designing and developing and implementing the dissemination strategy (1.2.2).</i></p>	<p>consultations, meetings, and stakeholder engagement.</p> <p>Beyond the impacts identified above, these tasks are recommended for Categorical Exclusion pursuant to the appropriate Reg. 216 citations and are, thus, excluded from further environmental review.</p>	<p>COVID-19 guidelines when implementing these tasks. Such measures may include, but are not limited to social distancing, use of personal protective equipment, limiting the size of gatherings and travel, and effective disinfection.</p>	<p>mitigation measure and the COVID plan</p>		<p>Director</p>	
Category 2: Develop and test peri-urban water and sanitation (WATSAN) business models and contractual mechanisms.						
<p>Subcategory 2.1: Develop, test, and provide technical assistance (TA) to approaches/models for water supply including: (a) existing</p>	<p>The proposed research and TA would have negligible direct potential adverse impacts. However, the results will inform</p>	<p>Negative Determination subject to the following conditions:</p> <ul style="list-style-type: none"> • Develop and implement a 	<p>Social engagement program for water access issues.</p> <p>Compliance</p>	<p>During identification of partners and during trainings and</p>	<p>Environmental Coordinator, MSD Team, SRG Team</p>	<p>TBD</p>

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>public private partnership (PPP), (b) direct contract between the Provincial Authority and a single water operator, (c) performance-based contracts between Decentralized Territorial Entities/Entité Territoriales and one or more existing operators. This includes the following activities: <i>assessing and designing potential water service delivery mechanisms (3.1.1).</i></p>	<p>“potential investors, operators and authorities on best practices” for the construction, expansion, rehabilitation and operation of the water and sanitation system in order to “increase and sustain access to clean water and safe sanitation services.” The resulting improvement of operations and associated improved access to water supply, and the design, may engender the following potential indirect adverse impacts:</p> <ul style="list-style-type: none"> • Potential conflict between adjacent communities without improved access to water. • Continuation of potential adverse impacts of current 	<p>social engagement program in/around the target community to address potential water access issues.</p> <ul style="list-style-type: none"> • At initiation of operational research of PPP-managed system, complete assessment for compliance with good environmental and safety practices and the Government of the DRC requirements. Include TA to assist the PPP to address the findings. • Environmental mitigation training will be included in TA support to operators and governing entities; and will be 	<p>assessments of good environmental and safety practices.</p> <p>Environmental considerations included in due diligence and selection process.</p>	<p>reported quarterly</p>		

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
	operation of the PPP managed water system (See Category 4 for list of potential impacts) • Environmental degradation and transmission of disease, if design and operating measures to address potential impacts are not in place. (See Category 4 for list of potential impacts)	conducted by Activity field staff in conjunction with the governing environment staff, when appropriate. • Implementation of infrastructure will follow Subcategory 4.1 or 4.2, as appropriate. For established service providers, they will need to have an environmental plan.				
Subcategory 2.2: Develop and test innovative models/approaches for sanitation and hygiene service delivery, including establishment of a partnership model, design of prototype sanitation products, and accompanying services that cover full sanitation value chain.	The proposed research would have negligible potential direct adverse impacts. However, the results will inform “potential investors, operators and authorities on best practices” for the construction, expansion, rehabilitation, and operation of the	Negative Determination subject to the following conditions: • Develop and implement social engagement program in/around target community to address potential water access issues.	Social engagement program for water access issues. Compliance assessments of good environmental and safety practices. Environmental	During identification of partners and during trainings and reported quarterly	Environmental Coordinator, Sanitation Team, SRG Team	TBD

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
This includes the following activities: <i>assessing and designing potential sanitation service delivery mechanism (3.2.1); and designing engineering and implementing sanitation infrastructure (3.2.2).</i>	sanitation system in order to “increase and sustain access to clean water and safe sanitation services.” The resulting improvement of operations and associated improved access to sanitation services, and the design, may engender the following indirect adverse impacts: <ul style="list-style-type: none"> • Potential conflict between adjacent communities without improved access to sanitation. • Environmental degradation and transmission of disease, if design and operating measures to address potential impacts are not in place (See Category 4 for list of potential impacts) 	<ul style="list-style-type: none"> • At initiation of operational research of PPP-managed system, complete assessment for environmental compliance. Include TA to assist the PPP to address the findings. • Implementation of infrastructure will follow Subcategory 4.1 or 4.2, as appropriate. <p>The service provider will need to have in place an operational EMMP.</p>	considerations included in due diligence and selection process.			
Subcategory 2.3: Development of	The proposed planning effort would	Negative Determination	Discussions with	During stakeholder	Environmental Coordinator,	TBD

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>master plan for Bukavu for sanitation services, as a prelude to installation of a pilot model for sanitation service delivery. This includes the following activities: <i>assessing and designing potential sanitation service delivery mechanism (3.2.1).</i></p>	<p>have negligible potential direct adverse impacts. However, the results will inform the pilot model as well as the design, construction, expansion, rehabilitation, and operation of the sanitation system in the selected areas. The improvement of operations and associated improved access to water supply, and the design, may engender the following indirect adverse impacts:</p> <ul style="list-style-type: none"> • Environmental degradation and transmission of disease, if design and operating measures to address potential impacts are not in place (See Category 4 for list of potential impacts) 	<p>subject to the following conditions: Incorporate and promote sound environmental management practices in each planning stage, in conformity with relevant chapters of USAID's Sector Environmental Guidelines: Water Supply & Sanitation. Planning and design should include:</p> <ul style="list-style-type: none"> • review and evaluation of potential solutions and technologies; • engagement with stakeholders, and; • assessment of potential adverse impacts from the selected design. 	<p>stakeholders in the planning process</p> <p>Environmental considerations included in sanitation master plans including potential adverse impacts.</p>	<p>meetings and development of master plans. Reported quarterly.</p>	<p>Sanitation Team, SRG Team</p>	

Category 3: Support Access to Financing for Water and Sanitation.

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>Subcategory 3.1: Complete detailed financial modeling of each of the models/approaches/d esigns for provision of WATSAN services to ensure sustainable cost-recoverability. This includes the following activities: <i>implementing water sector delivery models (3.1.3).</i></p>	<p>The detailed financial modeling effort would have negligible potential adverse impacts. The results will inform the design, construction, expansion, rehabilitation, and operation of the WATSAN system in the selected areas, and may engender the following indirect adverse impacts:</p> <ul style="list-style-type: none"> • Environmental degradation and transmission of disease, without consideration of ESDM in design (See Category 4 for list of potential impacts). 	<p>Negative Determination subject to the following conditions: Incorporate and promote sound environmental management practices in each model, in general conformity with relevant chapters of USAID’s Sector Environmental Guidelines: Water Supply & Sanitation. Financial modeling to consider environmental mitigation costs such as PPE, safety training, environmental best practices for O&M tasks, etc.</p>	<p>Environmental considerations and costs included in financial models.</p>	<p>During the development of financial models for service delivery approaches and reported quarterly.</p>	<p>Environmental Coordinator, MSD Team, Sanitation Team, SRG Team</p>	<p>TBD</p>
<p>Category 4: Rehabilitation and Expansion of WATSAN infrastructure in peri-urban areas.</p>						
<p>Subcategory 4.1: Small-Scale Water and Sanitation Infrastructure</p>	<p>In the absence of complicating factors, small-scale construction or</p>	<p>Negative Determination subject to the</p>	<p>Site-specific, design-specific EMMPs incorporating</p>	<p>During Level 4 detailed design for water and</p>	<p>Environmental Coordinator, Infrastructure Team, MSD</p>	<p>TBD</p>

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>Rehabilitation and Construction. This includes the following activities: <i>completing design engineering and implementing infrastructure improvements (3.1.2); developing and implementing sanitation infrastructure (3.2.3); and developing and implementing sanitation sector (3.2.4).</i></p>	<p>rehabilitation of WASH infrastructure are unlikely to create significant adverse impacts if design and operating measures to address potential impacts are in place. However, the precise nature of the potential impacts—and the appropriate design and operating practices to mitigate them—are highly dependent both on location and the specific characteristics of the infrastructure. This requires a site-specific, design-specific assessment of potential adverse impacts and the efficacy of available mitigation measures for the specific proposal. For large-scale WASH rehabilitation or construction, see Subcategory 4.2.</p>	<p>following conditions:</p> <p>Good-practice design standards must be implemented for new construction and rehabilitation works, generally consistent with USAID’s Sector Environmental Guidelines: Water Supply & Sanitation. At a minimum, the site specific EMMPs must specify the following standards:</p> <p>i. For water supply, they must include siting of new wells well away from groundwater contamination sources (e.g., latrines, cesspits, dumps), exclusion of livestock from</p>	<p>good-practice design standards and assessment of potential adverse impacts and the efficacy of available mitigation measures for the specific site. The site-specific EMMPs will include the following minimum indicators for water systems: Frequency with which domesticated animals are found near the point of use; Perimeter at the point of use not enclosed within fencing or the equivalent (in</p>	<p>sanitation systems and Level 4 implementation of construction. Reported quarterly.</p> <p>During capacity building training sessions. Reported quarterly.</p>	<p>Team, Sanitation Team, SRG Team Environmental Coordinator</p> <p>Infrastructure Team</p>	

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
		<p>water points, and prevention of standing water at water supply points.</p> <p>ii. For latrines, they must include provisions to prevent contamination of water supplies, appropriate choice of latrine type given local environmental conditions (e.g., pit latrines are rarely suitable in locations where the water table is high), provision of hand wash stations, and development and implementation of a system for ongoing latrine cleaning and maintenance.</p> <p>Environmental Review Form/Environme</p>	<p>meters);</p> <p>Number of times fecal coliform bacteria are measured;</p> <p>Exceedance of water quality standards;</p> <p>Stagnant water visible at project site;</p> <p>Number of well-functioning systems with leaks.</p> <p>The site-specific EMMPs will include the following minimum indicators for sanitation systems:</p> <p>Water quality reports;</p> <p>Number of latrines where water table level has been</p>			

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
		<p>Final Review Report (ERF/ERR). Given that the location and scale of certain WASH rehabilitation and construction activities will depend on future assessments and studies, site-level review is needed to determine the necessary environmental impacts and mitigation measures. Therefore, the AFR ERF/ERR is required for each small-scale WASH rehabilitation or construction activity.</p> <p>Water quality assurance plan. Prior to drinking water provision, the project will</p>	<p>verified and documented; Number of latrines located less than 30 m from nearest water source; Operation and maintenance (O&M) plan</p> <p>Scoping surveys during detailed design will identify environmental impacts.</p> <p>Site-specific Environmental Review Form/Environmental Review Report (ERF/ERR).</p> <p>Water quality assurance plan (WQAP).</p> <p>Number of service providers/owne</p>			

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
		<p>prepare and receive approval for a project-level Water Quality Assurance Plan (WQAP) to ensure that all new and rehabilitated USAID-funded sources of drinking water provide water that is safe for human consumption.</p> <p>Capacity-building in equipment/ system maintenance must be co-programmed with construction/installation of water supply and sanitation infrastructure.</p>	<p>rs trained on proper use and maintenance of the system.</p>			
<p>Subcategory 4.2: Large-scale water or complex small scale and Sanitation</p>	<p>Larger scale WASH infrastructure that will require more detailed</p>	<p>Scoping Study / Environmental assessment detailing the</p>	<p>As defined in the specific scoping study and the site</p>	<p>As defined in the specific scoping study and the site</p>	<p>Environmental Coordinator Infrastructure</p>	<p>As defined in the specific scoping study and the site specific EMMP.</p>

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
<p>Infrastructure Rehabilitation and Construction. This includes the following activities: <i>completing design engineering and implementing infrastructure improvements (3.1.2); developing and implementing sanitation infrastructure (3.2.3); and developing and implementing sanitation sector (3.2.4).</i></p>	<p>environmental assessment. For the purposes of this category, by definition, this will include any works that would trigger a Positive Determination in accordance with the IEE requirements.</p> <p>A determination will need to be made with The AOR and BEO to propose the extent of the scoping statement and environmental assessment required.</p> <p>This requires a site-specific, design-specific environmental assessment report including a determination of any potential adverse impacts together with mitigation measures proposed</p>	<p>potential environmental issues and mitigation</p> <p>The mitigation requirements will be detailed in the EMMP together with a monitoring plan</p> <p>The site specific EMMP is to satisfy all the requirements of the IEE for subcategory 4.2.</p>	<p>specific EMMP.</p>	<p>specific EMMP.</p>	<p>Team</p>	

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
	for the specific proposal. The assessment would cover both the requirements of the USG 216 regulations and any host country environmental compliance issues. It is likely that the report will require acceptance by the ACE.					
Category 5: Training, capacity building and community engagement.						
Subcategory 5.1: Forums and capacity development initiatives aimed at increasing investment markets. This includes the following activities: <i>improving coordination and negotiation power of supply chain actors (2.2.1); and increasing capacity and ability of supply chain infrastructure suppliers to respond to WATSAN needs (2.2.2).</i>	These activities will have negligible impacts on the environment, however, if highly infectious, high-consequence diseases (e.g., COVID-19) are present, human health could be impacted, particularly during in-person consultations, meetings, and stakeholder engagement.	Negative Determination subject to the following conditions: • Entrepreneurs/ service providers benefiting from activities in this category will receive complementary TA emphasizing and fully integrating environmentally sound practices.	Social engagement program for water access issues. Compliance assessments of good environmental and safety practices. Environmental considerations included in due diligence and selection	During forums and capacity building events. Reported quarterly.	Environmental Coordinator, Infrastructure Team, MSD Team, Sanitation Team, SRG Team	TBD

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
	<p>The results will inform the development of business models aimed at supporting and scaling WATSAN markets, which may engender the following indirect adverse impacts:</p> <ul style="list-style-type: none"> • Potential conflict between adjacent communities without improved access to water. • Environmental degradation and transmission of disease if design and operating measures to address potential impacts are not in place (see ESDM, Category 4 for list of potential impacts). 	<ul style="list-style-type: none"> • Incorporate and promote sound environmental management practices throughout, in general conformity with relevant chapters of USAID’s Sector Environmental Guidelines: Water Supply & Sanitation. 	process.			
<p>Subcategory 5.2: Support operators by facilitating training, coaching, and exchanges, and capacity building sessions. This</p>	<p>Presence of COVID-19 - a highly infectious, high-consequence disease, could impact human health, particularly</p>	<p>Negative Determination subject to the following conditions: The Activity will adhere to current,</p>	<p>Identification of any COVID-19 positive situations. MEL team to monitor measures as</p>	<p>At same frequency as defined in Line with the MEL</p>	<p>Activity management and administrative staff; Activity technical staff.</p>	<p>The global COVID-19 pandemic continues as of the writing of this EMMP. Therefore, mitigation measures will remain in place until further notice.</p>

Project/Activity/Sub-Activity	Identified Environmental Aspects or Impacts	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Responsible Parties	Field Monitoring /Issues/Resolution Field monitoring needs to be adequately addressed i.e., monitoring dates, observations, issues identified and resolution
includes the following activities: <i>increasing understanding and coordination of WATSAN governing entities (2.1.2); and improving the ability of governing entities to design, manage, and enforce contracts and procurement processes (2.1.3).</i>	during in-person consultations, meetings, and stakeholder engagement. Beyond the impacts identified above, these tasks are recommended for Categorical Exclusion pursuant to the appropriate Reg. 216 citations and are, thus, excluded from further environmental review.	applicable COVID-19 guidelines when implementing these tasks. Such measures may include, but are not limited to social distancing, use of personal protective equipment, limiting the size of gatherings and travel, and effective disinfection.	per the mitigation measure and the COVID plan	Monitoring Plan		

USAID APPROVAL OF EMMP

Approval:	_____	_____
	Sandy Ngilambi, AOR [required]	Date
Clearance:	_____	_____
	Diana-Elizabeth Mbandzidi, Mission Environmental Officer and Climate Integration Lead [as appropriate]	Date
Clearance:	_____	_____
	[NAME], Regional Environmental Advisor [as appropriate]	Date
Concurrence:	_____	_____
	[NAME], _____ Bureau Environmental Officer [as appropriate]	Date

DISTRIBUTION:

ANNEX 1: CLIMATE RISKS, OPPORTUNITIES, AND ACTIONS

This IEE climate risk management (CRM) screening identifies climate-related risks to WASH project categories that should be addressed in order to enhance resilience and safeguard activity development objectives. This screening is required under ADS Chapter 201 “Climate Risks Management for USAID Projects and Activities.” The Democratic Republic of the Congo (DRC) is the 8th most vulnerable country in the world to climate change and the 13th least prepared to respond to impacts. The DRC also faces many water and sanitation (WATSAN)-related issues, such as high rates of malaria and low access to safe drinking water and sanitation. Thus, climate change will have significant impacts on WATSAN infrastructure and operations.

RISK RATINGS AND DEFINED ACTIONS

The following summarizes the risk screening findings and actions from the IEE. The complete results of the CRM screening are provided below.

Water Supply and Quality: Increased temperatures, frequency and intensity of dry spells, and changes in seasonal flows of water may decrease water supplies or affect expected timing of supplies, as well as increase water demand. Water quality may also decrease due to higher temperatures (through eutrophication), increased dryness (through higher pollutant concentrations), and increased rainfall and flooding, requiring changes in treatment and operations.

- Climate change risks that had direct impacts on water supply, quality, and demand were rated high.

Infrastructure: Increased frequency of intense rainfall events and flooding could damage WATSAN infrastructure, as well as disrupt power sources, which impact WATSAN operations and services. Extreme events could also overflow sanitation infrastructure, causing potential pollution in water infrastructure or sensitive areas.

- Climate change impacts on WATSAN infrastructure were rated high.

Governance: Climate change impacts that result in extreme weather events could cause emergencies that need responding to and may strain government resources. Increased frequency of intense rainfall events and flooding could make it more difficult to conduct research field assessments of WATSAN services, while changing climate conditions in general could result in incorrect assumptions about future water supply and quality if not incorporated into applied research and strategic planning.

- Impacts to government resources and research and projections about future water supply and quality were rated as moderate risks.

Participation: Climate hazards such as high temperatures as well as increased frequency and intensity of rainfall events, drought, and flooding could create stressors on people’s health, food sources, and livelihoods, reducing capacity to participate in WATSAN-related training and community engagement. Extreme events such as flooding can also hinder attempts to gather for training and engagement.

- Climate change risks that reduce people’s capacity to participate in trainings and community engagement were rated low.

The USAID project team has identified activity actions and analyses to respond to these risks that are applicable to the Sustainable Water and Sanitation Systems Activity, as documented in the table below. These recommendations include:

- Incorporate changing climate projections into modeling for water supply, water demand, and performance of WATSAN infrastructure
- Improve drainage, use flood barriers, or relocate facilities to less exposed locations to protect WATSAN infrastructure
- Repair and upgrade existing WATSAN infrastructure in highly exposed areas
- Partner with electricity providers to protect electrical equipment that serve critical WATSAN facilities

Additionally, Engineering analysis preceding design activities must include consideration of climate change and its potential impacts on the location (siting), functionality and sustainability of resulting infrastructure and infrastructure services. Such analysis must include identification of relevant data sets and gaps, review of local building standards and codes for adequacy; and determination of safety factors or other measures of uncertainty that will be carried through design. The results of this analysis, including risks identified and how they are addressed, shall be documented.

Each site specific EMMP will include a CRM Activity Tool Matrix to define anticipated tasks or interventions, describe the climate risks and adaptive capacity for each intervention, assign a climate risk rating, describe the opportunities and management options to address the risks, describe the next steps for activity implementation, and address accepted climate risks. The Activity Team will utilize the following [USAID Climate Risk Screening and Management Tools](#) when completing the CRM Activity Tool Matrices:

Project Tool:

[Climate Risk Screening and Management Tool for Project Design + Annexes](#)

[Climate Risk Screening and Management Tool for Project Design - Matrix Template](#)

PROJECT CLIMATE RISK MANAGEMENT SUMMARY TABLE FROM IEE

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
<p>Category 1: Conduct research and applied research and baseline assessments of water and sanitation (WATSAN) services</p>	<p>Increased frequency of intense rainfall events and flooding could make it difficult to conduct research field assessments of WATSAN services. Changing climate conditions, such as projected changes in temperature, rainfall patterns, and drought, may result in incorrect conclusions and assumptions if not incorporated into applied research about future ground and surface water availability, water quality, water demand, and water supply and sanitation infrastructure needs and performance.</p>	<p>Moderate</p>	<p>TBD</p>	<p>Project implementers to incorporate climate change in assessments.</p> <p>Contractors to conduct field assessments/ monitoring of investments during certain periods of the year based on climate trends.</p> <p>Contractors should implement projects in a manner that is consistent with relevant climate policies and procedures.</p> <p>Develop contingency plans for investments that may be disrupted by climate events.</p> <p>Incorporate projections of future climate conditions in planning and design of WATSAN services and infrastructure.</p> <p>Develop contingency plans for assessments that may be disrupted by field conditions.</p>	<p>Note: Revisit during implementation. Look for opportunities to leverage existing research capacity in climate change and improve data management and collection.</p> <p>Prepare to manage activities adaptively and communicate frequently. For example, partners should establish alternate dates for meetings and deliveries, location-based activities could include plans to use alternate access routes. This creates opportunities to establish conditions for preparedness, active learning and needed corrections during implementation.</p> <p>Develop and maintain climate change model projections for use in defining interventions to meet D.O.s.</p>

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
<p>Category 2: Develop and test peri-urban water and sanitation (WATSAN) business models and contractual mechanisms</p>	<p>Partners are encouraged to assess site-specific risks which may include:</p> <ul style="list-style-type: none"> - Increased evaporation due to higher temperatures, changes in timing of water and groundwater recharge due to seasonal variation and decreases in water sources overall due to drought will likely decrease available water supplies. This may affect current business models and contracts which may be based on historical water supply regimes. - Higher temperatures (which can increase eutrophication and concentrations of pathogens and bacteria), increased dryness and drought (which results in higher pollutant concentrations), and increased rainfall and flooding (which can increase turbidity, sedimentation, and pollutants from runoff) can all decrease water quality, 	<p>High</p>	<p>TBD</p>	<p>Incorporate changing water supply due to climate change into business models and contracts for WATSAN services.</p> <p>Integrate climate change projections into projections of water supply, water demand, and performance of WATSAN infrastructure.</p>	<p>Consider potential of water management and conservation programming to optimize use of available water supplies to support water-dependent D.O.s. (e.g., WATSAN, FTF).</p>

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
	<p>requiring changes in treatment protocols.</p> <p>-Precipitation variability can cause changes in expected flows, potentially disrupting treatment efficiency and leading to higher costs.</p> <p>- Higher temperatures, increased frequency of intense rainfall events that affect water quality, and increased frequency of prolonged drought may increase water demand beyond what has been historically expected.</p>				

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
<p>Category 4: Rehabilitation and Expansion of WATSAN infrastructure in peri-urban areas</p>	<p>Increased frequency of intense rainfall events and flooding could damage water and sanitation infrastructure. Higher temperatures and increased frequency of intense rainfall events and flooding could disrupt power sources, which impact the operation of water and sanitation treatment facilities. Increased frequency of intense rainfall events and flooding could overflow sanitation infrastructure, causing potential pollution in water infrastructure or other sensitive areas. Increased evaporation due to higher temperatures, changes in timing of water and groundwater recharge due to seasonal variation and decreases in water sources overall due to drought will likely decrease available water supplies. This could make it difficult to sustain or provide access to water after implementation of water supply infrastructure activities.</p>	<p>High</p>	<p>TBD</p>	<p>Improve drainage, use flood barriers, or relocate facilities to less exposed locations to protect infrastructure.</p> <p>Repair and upgrade existing WATSAN infrastructure, particularly those in highly exposed areas.</p> <p>Use climate resilient technologies to mitigate risks of climate change impacts on WATSAN infrastructure.</p> <p>Partner with electricity providers to protect electrical equipment that serve critical WATSAN facilities.</p> <p>Design and build ecological sanitation latrines that do not allow infiltration into water tables.</p>	<p>Work with local WATSAN committees to improve operations and maintenance of infrastructure.</p> <p>Incorporate climate change projections to avoid placement in highly exposed areas when planning sites of future WATSAN infrastructure that work toward D.O.s.</p>

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
<p>Category 5: Training, capacity building and community engagement</p>	<p>Higher temperatures and increased frequency of intense rainfall events and prolonged droughts could create stressors on people's health, sources of food, and livelihoods. This may reduce people's capacity to participate in training, capacity building, and community engagement.</p> <p>Increased frequency of intense rainfall could cause flooding, hindering attempts to gather for training and community engagement.</p> <p>Increased temperatures may increase odors of latrines, making use of them less attractive and increasing challenges in efforts to change human behavior to improve public health.</p> <p>Higher temperatures and increased frequency of intense rainfall and flooding may increase range and rates of transmission for diseases. These include malaria (suitability will likely increase in the Kwango and Kivu Provinces and</p>	<p>Low</p>	<p>TBD</p>	<p>Work with communities to build awareness and adaptive capacity to mitigate risks of climate impacts on WATSAN infrastructure and operations.</p> <p>Work with communities and community leaders to identify gathering sites that are accessible in different climate scenarios.</p> <p>Increase water security (such as through stormwater capture and community water supplies) to prevent conflict amongst water users.</p> <p>Design floodproof latrines, such as those that are elevated, or use natural infrastructure which can help with flood management around latrine facilities.</p> <p>Incorporate climate change projections into public health programs to target treatment in the most vulnerable communities.</p> <p>Increase water treatment, such as through chlorination of municipal water supplies, to reduce disease.</p>	<p>Partner with livelihood programs to increase training, capacity building, and community engagement in interventions that work toward D.O.s.</p>

1: Tasks / Defined or Anticipated Tasks or Interventions*	2: Climate Risks*	3: Climate Risk Rating*	4: How Climate Risks are Addressed in the Activity*	5: Further Analysis and Actions for Project/Activity Design/ Implementation	6: Opportunities to Strengthen Climate Resilience
	<p>potentially decrease in central and northwest regions), waterborne diseases like cholera, and emerging infectious diseases like Monkeypox virus. These impacts on human health could decrease people's capacity to participate in training and community engagement.</p>				

ANNEX 2 – SUSTAINABLE WATER AND SANITATION SYSTEM ACTIVITY RESULTS FRAMEWORK

