Office of Internal Oversight Services

INTERNAL AUDIT DIVISION

REPORT 2025/004

Audit of waste management in the United Nations Mission in the Republic of South Sudan

The Mission needed to enhance waste management by addressing gaps in waste handling, infrastructure and oversight

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Audit of waste management in the United Nations Mission in the Republic of South Sudan

EXECUTIVE SUMMARY

The Office of Internal Oversight Services (OIOS) conducted an audit of waste management in the United Nations Mission in the Republic of South Sudan (UNMISS). The objective of the audit was to assess the adequacy and effectiveness of waste management processes to ensure UNMISS operates at minimum risk to personnel, local communities and ecosystems. The audit covered the period from July 2022 to June 2024 and included: (a) planning, oversight and monitoring of waste management, (b) waste and wastewater management activities, and (c) environmental inspections and verification.

UNMISS developed an adequate, updated waste management plan to minimize environmental impact in alignment with the United Nations Environment Strategy 2023-2030. This was supported by established environmental committees, with ongoing efforts to ensure regular engagement of Field Office Environmental Committees and strengthen environmental governance at the operational level. Additionally, the Mission adequately managed electronic waste and implemented best practices to reduce its environmental footprint. However, the audit identified various weaknesses, including gaps in monitoring and reporting environmental performance, inadequate enforcement mechanisms to ensure environmental compliance across all waste types, delays in operationalizing essential waste management infrastructure and equipment, and other shortcomings in environmental inspections and verifications.

OIOS made five recommendations. To address issues identified in the audit, UNMISS needed to:

- Take measures to ensure complete and consistent reporting of key environmental performance indicator data in the reporting dashboard and align environmental compliance thresholds with established standards in Mission Directive No. 2019/04.
- Strengthen enforcement mechanisms to improve environmental compliance and enhance standardized waste segregation, recycling, and composting efforts across all locations.
- Develop enforcement mechanisms to ensure compliance with standard operating procedures for hazardous waste management.
- Operationalize the supporting infrastructure and equipment for waste management.
- Enhance environmental inspections and verifications.

UNMISS accepted all recommendations and has implemented two recommendations and initiated action to implement the remaining three recommendations. Actions required to close the recommendations are indicated in Annex I.

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Audit of waste management in the United Nations Mission in the Republic of South Sudan

I. BACKGROUND

1. The Office of Internal Oversight Services (OIOS) conducted an audit of waste management in the United Nations Mission in the Republic of South Sudan (UNMISS).

2. Due to their operational footprint, size, mandates, and various organizational supporting structures, peacekeeping operations have unique environmental considerations distinct from other Secretariat entities. In March 2022, the Departments of Operational Support (DOS), Department of Peace Operations (DPO) and Department of Political and Peacebuilding Affairs adopted the Environmental Policy for Peacekeeping Operations and Field-based Special Political Missions (SPMs). The policy provides guidance to manage or maintain facilities and infrastructure, have operational control of energy or water provision, manage wastewater, waste treatment and disposal, and any other relevant and significant environmental aspects.

3. DOS subsequently developed the Environmental Action Planning and Performance application (eAPP)[1] to assess and monitor missions' environmental activities to reduce risks and improve efficiency in using natural resources. The Mission-wide Environmental Plan (MEAP) consists of five pillars: (i) environmental management system, (ii) water and wastewater management, (iii) solid waste (hazardous and non-hazardous), (iv) energy management, and (v) broader impact. In 2022, DOS also developed the Waste Management Handbook for Peace Operations and SPMs (Waste Management Handbook) and a Water and Wastewater Manual to ensure environmental objectives are met.

4. UNMISS has allocated responsibilities to a mix of technical sections/units, military and police contingents and contractors for all waste management, covering segregation/handling, storage, treatment and final disposal. As of July 2024, UNMISS had 21 locations designated as waste collection points, and had 113 wastewater treatment plants, including military and police contingent locations.

5. The Mission has an Environmental and Occupational Safety and Health (EOSH) Unit responsible for monitoring several environmental key performance indicators (KPIs) and conducting environmental inspections. EOSH is led by a Chief at the P-4 level and is supported by three personnel (one United Nations Police, one United Nations Volunteer and one General Service staff). The Mission also has an Engineering Environmental Unit responsible for handling waste management from engineering activities. The Engineering Environmental Unit is led by a Chief at the P-4 level, reporting to the Chief Engineer and supported by five personnel, four of which are United Nations Volunteers. There are no separate budgets for the Units apart from the staffing costs. Costs of equipment and contractual aspects are included in the budgets of the various technical sections.

6. UNMISS established an Environmental Committee chaired by the Chief of Operations and Resource Management to provide policy guidance on environmental compliance, develop strategies for environmental sustainability, review environmental performance reports, and review and follow up on the implementation of recommendations and action plans.

7. Data related to waste management is kept in disparate systems, including the eAPP, Mission Environmental KPI reporting dashboard, and Environmental Compliance Application (Compliance App),

[1] The eAPP software is a dedicated online platform for peace operations to improve environmental performance and risk management. It provides tools for data collection, validation, approval and reporting, as well as analytics and visualization to support decision-making. This application was launched in July 2020.

for which access is restricted to relevant staff only. However, staff members sometimes use their personal devices, such as phones to take photos and upload them to the applications. Other technical sections also keep information on their computers or shared drives, which could lead to the leakage of sensitive information if not restricted.

8. Comments provided by UNMISS are incorporated in italics.

II. AUDIT OBJECTIVE, SCOPE AND METHODOLOGY

9. The objective of the audit was to assess the adequacy and effectiveness of waste management processes to ensure UNMISS operates at minimum risk to personnel, local communities and ecosystems.

10. This audit was included in the 2024 risk-based work plan of OIOS due to the health, environmental, compliance and reputational risks related to waste management in UNMISS.

11. OIOS conducted this audit from August to October 2024. The audit covered the period from July 2022 to June 2024. Based on an activity-level risk assessment, the audit covered higher and medium risk areas in waste management, which included: (a) planning, oversight and monitoring of waste management, (b) waste and wastewater management activities, and (c) environmental inspections and verification.

12. The audit methodology included: (a) interviews with key staff involved in waste management to gain insights on how the Mission manages waste; (b) review of waste management policy, standard operating procedures and guidance to assess compliance; (c) analytical review of data governance and data management systems, processes and practices relating to the eAPP and Compliance App to assess completeness, reliability, and identify trends; (d) review of inspection and verification reports to assess the effectiveness and implementation status of recommendations; (e) field visits and physical inspections and observation of waste management practices in Juba, Malakal and Bentiu to validate practices against standards; and (f) review of waste management initiatives to evaluate their impact and sustainability.

13. OIOS assessed the reliability of data related to waste management in UNMISS by: (a) reviewing existing information about the data and the environmental compliance applications and dashboards; and (b) interviewing UNMISS personnel knowledgeable about the data. In addition, OIOS traced a random sample of data to source documents. Gaps in reliability of data are identified in the report.

14. The audit was conducted in accordance with the Global Internal Audit Standards.

III. AUDIT RESULTS

A. Planning, oversight and monitoring of waste management

UNMISS developed a waste management plan

15. Waste and wastewater management are two pillars of MEAP, which are designed to improve waste management, promote sustainable water abstraction, conservation, and the use of alternative water sources, while reducing risks to personnel, local communities, ecosystems and the environment.

16. The Mission's strategic and budget documents for 2023/24 and 2024/25 fiscal years highlighted support initiatives to mitigate environmental impact, reduce the overall environmental footprint, and ensure compliance with the United Nations environmental policy. To achieve this, in addition to the DOS Waste

Management Handbook and the Water and Wastewater Manual, UNMISS developed a Waste Management Plan (WMP) highlighting initiatives for waste reduction and minimization across Mission locations. In the 2024/25 fiscal year, the Mission planned to enhance wastewater and solid waste management through various initiatives, including installing solid waste management yards across all locations to facilitate proper waste disposal per established United Nations standards. In alignment with the United Nations Environment Strategy 2023-2030, the Mission planned to continue implementing a remote infrastructure monitoring system to optimize energy efficiency, reduce fuel usage, and conserve water.

Environmental committees were in place and action was taken to ensure Field Office Environmental Committees met regularly

17. UNMISS established two levels of environmental committees: (a) Mission Environmental Management Committee, which oversees environmental management at the Mission-level; and (b) Field Office Environmental Committees, which handles the implementation and monitoring of environmental initiatives in the field offices. Both the Mission-level and field-level committees had clear and approved terms of reference. The Mission Environmental Management Committee met and operated as per its terms of reference by providing policy guidance to units to ensure environmental compliance, developing strategies for environmental sustainability, reviewing the implementation of recommendations and follow-up actions by the responsible units, and reviewing environmental performance reports to offer technical guidance for improvement.

18. However, some of the Field Committees did not convene quarterly as mandated. During the audit, UNMISS took steps to remind the Field Committees of their responsibility to convene quarterly to improve their functioning.

Need to enhance monitoring and reporting of environmental performance

19. The United Nations Environmental Policy establishes reporting obligations on environmental performance and actions to improve performance. UNMISS environmental performance is measured regularly through the environmental KPI reporting dashboard and eAPP.

20. OIOS review of the Mission's Environmental Performance Scorecards (based on overall eAPP scoring) for the 2022/2023 and 2023/24 fiscal years indicated an improvement in environmental performance.

- In 2023/24, UNMISS scored 79 per cent on waste management, up from 75 per cent in 2022/23. Additional waste management indicators provided key metrics to support risk management and continuous improvement. Notably, UNMISS asserted that sites classified as having minimal wastewater risk achieved 100 per cent compliance, and an updated WMP and corresponding practices were in place.

- The 2023/24 performance noted an improvement in the proportion of solid waste sites operating at minimum risk (currently at 17 per cent, up from 4 per cent). However, areas for improvement were also noted, such as: enhancing composting of food and wet waste (currently at 8 per cent, down from 10 per cent), expanding the use of improved disposal methods (currently at 41 per cent, a slight decrease from 42 per cent), and addressing the shortage of human resources and lack of take-back solutions.

21. On the other hand, there was a need for improved data quality - in 2023/24, the Mission achieved a 63 per cent data quality rate, a significant drop from 85 per cent in 2022/23. OIOS further reviewed the

Mission environmental KPI reporting dashboard for completeness and reliability of data and made the following two important observations:

(a) Incomplete reporting in the environmental key performance indicator reporting dashboard

22. OIOS reviewed waste consumption KPIs for the period from January 2023 to June 2024 and found incomplete reporting, especially from the military contingents and formed police units (FPUs). The review identified that in solid waste reporting across multiple locations, 450 (or 42 per cent) out of the expected 1,062 monthly submissions from 59 sites did not completely report on the KPIs. Specifically, OIOS noted the following:

- Non-reporting by location: The review found that certain locations, such as Tomping (Juba - Contingent A Battalion 1) and Malakal (Civilian Camp), had the highest levels of non-reporting, each failing to submit data for 17 consecutive months. Other locations, such as Bor (Civilian Camp), Kuajok (Contingent B HMEC), Yambio (Contingent B Construction Engineering Company), and Yambio (Civilian Camp), also had significant non-reporting, missing 16 months of submissions.

- Non-reporting by month: A month-by-month analysis revealed that May 2023 had the most reporting failures, with only 3 of 59 sites submitting their data.

- Missing locations in the KPI dashboard: The review identified some locations that were not included in the KPI dashboard, such as Tomping, Bentiu, Akobo, Torit, Yei (United Nations Civilian Camps), Jamjam, Koch, Kuajok (Contingent C Battalion), Aweil (Contingent N Battalion) and Bentiu (Contingent CB).

(b) Inconsistencies between Mission Directive and Key Performance Indicator reporting dashboard compliance metrics

23. Mission Directive No. 2019/04 on UNMISS environmental standards outlines the expected thresholds for compliance performance. These thresholds have also been incorporated into the UNMISS environmental KPI reporting dashboard for continuous monitoring. However, OIOS review of the waste consumption thresholds noted inconsistencies in the use of the compliance metrics between the Mission Directive and the thresholds displayed on the dashboard, as detailed in table 1.

Table 1: **Comparison between Mission Directive and KPI reporting dashboard compliance metrics**

Category	Indicator and metric	Description	Environmental standards value	KPIs dashboard value
Waste	Waste consumption per capita (kg/person/day)	Out of compliance / under-performance	> 1.0	> 1.5
		Compliance performance	0.7 - 1.0	0.7 - 1.5
		Best in class performance	< 0.7	< 0.7

24. In addition, between January 2023 and June 2024, the UNMISS environmental KPI reporting dashboard reported 20 of 612 instances as non-compliant. However, another 35 of instances (making 55 in total) actually exceeded the established environmental standards threshold of greater than 1, meaning they should have been classified as non-compliant.

25. The above occurred because of gaps in the monitoring and reporting mechanisms implemented by UNMISS, particularly concerning military contingents. Incomplete and inconsistent reporting compromises

the reliability of environmental data, leading to gaps in oversight and the potential exacerbation of environmental hazards. Failure to address data quality issues and align compliance thresholds may hinder the Mission's ability to make informed decisions and implement timely corrective actions.

(1) UNMISS should: (a) take measures to ensure complete and consistent reporting of key environmental performance indicator data in the reporting dashboard; and (b) align environmental compliance thresholds with established standards in Mission Directive No. 2019/04.

UNMISS accepted recommendation 1 and stated that the Mission has since the audit fieldwork, revised the approach to collection and reporting of key environmental performance indicator data which has already led to significant improvement in the data. The Mission also discontinued the use of the environmental key performance indicator application and instead collected the information through its SharePoint portal, thereby avoiding duplication. UNMISS provided evidence of implementation of the changes and resultant improvement of the data. Based on the actions taken by UNMISS and the evidence provided, the recommendation has been closed.

B. Waste and wastewater management activities

Need for adequate enforcement mechanisms for solid waste management

26. OIOS reviewed the Mission's solid waste management activities, which included waste collection, segregation, and treatment and disposal, and noted the following issues.

(a) Solid waste collection and segregation

27. UNMISS reported generating 6.2 million kilograms of general solid waste in the 2023/24 fiscal year in the eAPP. The Mission's solid waste generation rate in the 2023/24 Mission Environmental Scorecard[2] was 0.95 kg/person/day, which was below the standard of 1.5 kg/person/day. However, OIOS field visits noted a need to address waste collection and segregation practices across the Mission. Some key observations included the following:

- At the Tomping camp, there was a need for improved segregation of solid waste, particularly at six military contingent camps. OIOS observed accumulated solid waste, including food, papers, plastic bags, twigs, engineering waste and plastic water bottles, especially in surrounding drains. Although management clarified that the solid waste found in the drains at UNMISS Tomping camp originated from upstream Juba and not from the camp itself, OIOS noted that these ended up in the camp and presented a risk to UNMISS.

- In Malakal, Contingent A did not segregate solid waste into biodegradable and non-biodegradable categories, leading to large quantities of mixed waste in the solid waste yard. Additionally, mixed scraps were found for the same contingent in the former hospital camp. Although efforts have been made to equip contingents with barrel incinerators, open burning was also observed in at least five locations within the camp despite the presence of two portable incinerators. Similar issues were noted in the same contingent's Horizontal Military Engineering Company (HMEC) compound.

[2] DOS monitors mission performance through the Mission Environment Scorecard, a composite index scored out of 100 points based on various environmental indicators.

- In Bentiu, the Contingent B Level II hospital and Contingent C camp also did not adequately segregate its solid waste segregation, as organic and non-organic solid waste were mixed together. Additionally, plastic bags and other non-organic materials mixed with food waste were dumped in compost pits.

- OIOS observed insufficient color-coded waste bins with clear labels for each type of waste to support proper waste segregation practices in and around contingent camps, including kitchens and dining halls.

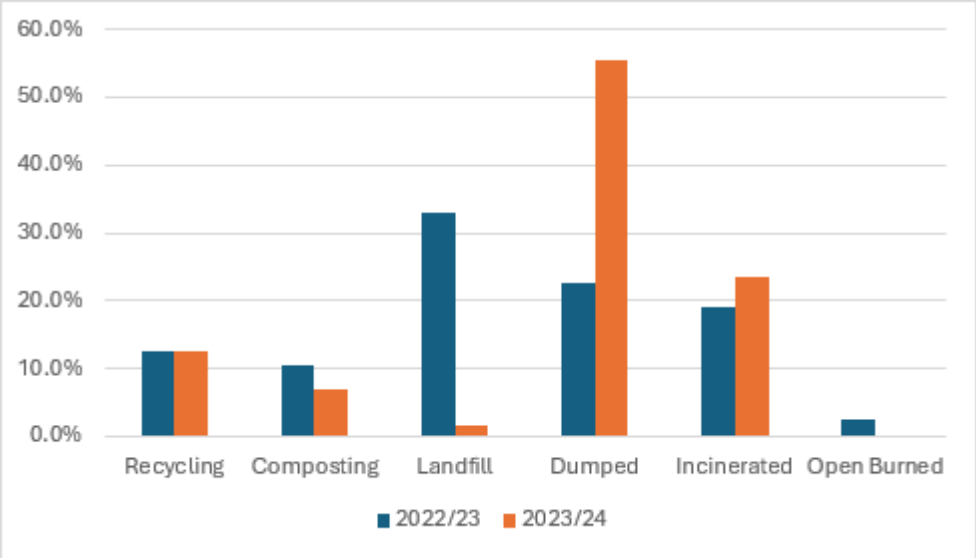
28. Additionally, OIOS review of the Mission solid waste report as of July 2024 indicated inconsistencies in the waste segregation system across 23 locations. For example, (a) 11 locations were segregating waste into three categories (recyclable, organic and non-recyclable); (b) segregation was limited to organic and non-organic in three locations; and (c) no segregation was practiced in nine locations, with all waste classified as general waste. The Mission inspections identified the need for further improvements, and additional training or education on proper waste segregation.

(b) Solid waste treatment and disposal

29. The Waste Management Handbook outlines various solid waste management solutions for adherence to minimum standards for effective treatment and disposal. These solutions are categorized into two groups: (a) waste minimization solutions, which include reuse, recycling, composting and biogas/energy recovery; and (b) waste disposal solutions, which encompass incineration and dumpsites. Controlled disposal at dumping sites remains the last resort for specific waste streams when no contractor, service, or technology is available for proper treatment and disposal.

30. Figure 1 below shows the details of how the disposal of solid waste was carried in the 2023/24 and 2022/23 fiscal years, as reported in the Environmental Performance Scorecards.

Figure 1: **Analysis of disposal of general solid waste by category**



Source: eAPP data for disposal of general solid waste

31. OIOS review of the eAPP data noted progress in some areas, while others still required improvement in the Mission's waste management practices. The substantial decrease in the use of landfills[3] and open burning, alongside the rise in incineration, reflects a commitment to better waste disposal practices. However, the increase in dumped waste and decline in composting efforts indicate that appropriate actions are required to address these negative trends in waste management practices. Strategies to enhance recycling and composting and reduce dumped waste would align with best practices for sustainable waste management. Also, while UNMISS indicated there were no landfills in the Mission's area of operation, the eAPP still showed this category. UNMISS stated that the Mission will address this anomaly with DOS.

32. The above issues occurred because UNMISS had not adequately implemented and enforced its standardized waste segregation systems across the Mission. The Mission clarified that the main challenge arises when contingents rotate, and new troops take over without a good understanding of the standards. Although the EOSH Unit conducted various initiatives, including training new troops, in OIOS' view, the root cause of the problem (maintaining standards even after rotation) is not adequately addressed, causing systemic waste management issues year after year. Inadequate waste management practices, including poor segregation and disposal of waste, could lead to increased operational costs and potential recycling inefficiencies and increased environmental impact.

(2) UNMISS should strengthen enforcement mechanisms to ensure standardized waste segregation across all locations and enhance strategies to promote recycling and composting.

UNMISS accepted recommendation 2 and stated that the Mission is committed to strengthening mechanisms in ensuring improved environmental compliance across all locations.

Insufficient controls over hazardous waste containment, collection, storage and disposal

33. The Waste Management Handbook identifies hazardous waste management as a significant challenge in field missions. Standard control systems are needed, including SOP and a requirement to send hazardous waste to the Property Disposal Unit (PDU) for disposal. The DPO/DOS SOP for developing waste management plans requires hazardous waste segregation, containment, collection, and proper storage procedures to prevent incompatible interactions. This includes off-the-ground storage in a roofed, bunded area to prevent soil contamination.

34. UNMISS had guidelines and procedures for managing hazardous waste, including EOSH inspections and recommendations, and the Mission indicated that it carried out enforcement actions. However, OIOS field visits observed the following issues:

(a) Management and disposal of biomedical waste

35. Due to their infectious nature or specialized medical use, biomedical waste generated from UNMISS medical facilities is considered hazardous and must be managed and disposed of in accordance with specific protocols and standards established by the Medical Unit in August 2024. This SOP included guidance on the proper handling of biomedical waste for off-site disposal and aims to minimize the storage time of medical waste.

[3] While UNMISS indicated there were no landfills in the Mission's area of operation, the eAPP still showed this category. UNMISS stated that it would address this anomaly with DOS.

36. For biomedical waste collected from Level I and II clinics (including dental facilities), the Mission utilizes incinerators instead of encapsulation[4] and solidification, which is the standard disposal method for biomedical waste. OIOS made the following observations in Bentiu and Malakal:

- For April 2024, the biomedical waste incinerator at a Level II hospital in Malakal was non-functional. Consequently, biomedical waste was disposed of using an incinerator designated for solid waste at the waste management yard. Also, there was no evidence that biomedical ash was adequately disposed of through encapsulation. Subsequent to the audit field visit, UNMISS advised OIOS that the indicated incinerator was repaired and functioning.

- Incomplete biomedical waste incineration was noted at the Level II hospital in Bentiu. Biomedical waste was found mixed with solid waste and dumped in the solid waste yard. Additionally, the biomedical ash was not encapsulated and was stored improperly in two large boxes placed above sea containers for the past year due to inadequate storage capacity.

37. Although an SOP was in place, there was a need to enhance the current enforcement mechanism to ensure the Mission's policy on the proper handling, storage, and disposal of biomedical waste and ash was always complied with.

(b) Management and disposal of petroleum, oils, lubricants, batteries and filters

38. OIOS visited transport workshops, generator farms, PDU yards, military, police and civilian camps in Tomping, United Nations House, Bentiu and Malakal and observed that there were stockpiles of used oil, oil filters, air filters, tyres, batteries, vehicle spare parts and scrap metals. Specifically, the following issues were observed:

- In Malakal, the Contingent A HMEC camp had scrap management issues. The vehicle workshop accumulated used filters, while Bravo camp became cluttered with heaps of engineering waste. At Battalion 1 of the same contingent, there was insufficient storage for used oil filters and oil. Improper storage of used tyres and batteries was observed behind the light vehicle and transport workshops.

- In Tomping, open dumping at Contingent D Force Reserve Battalion led to an accumulation of mixed solid waste. This waste comprised used air filters, oil containers, tyres, and general waste.

- Similarly, the Bentiu transport workshop faced issues with improperly stored used tyres and batteries. At the Contingent E Level II hospital, used batteries were kept in the generator farm, and the MSA 1 generator farm had a pile of used oil filters, air filters, and lead-acid batteries. If not addressed promptly, this accumulation could result in ground contamination from oil spillage. Additionally, there was no proper storage shed for used oil to ensure proper management of such hazardous waste.

39. OIOS noted that the EOSH had made recommendations in March and April 2024 to address these issues. However, as of September 2024, the Malakal and Bentiu field offices had not taken corrective actions.

40. The above occurred because UNMISS had not adequately enforced compliance with its hazardous waste management SOPs, including ensuring the proper segregation, storage and disposal. Improper

[4] Encapsulation is a method to contain hazardous waste products or ash through solidification in a concrete mix of sand, gravel, and cement. Level II clinics are responsible for their own encapsulation activities.

handling and delays in the collection of hazardous waste could pose health and environmental risks to Mission personnel and, ultimately, the surrounding population if not addressed promptly.

(3) UNMISS should develop enforcement mechanisms to ensure compliance with the hazardous waste management standard operating procedures.

UNMISS accepted recommendation 3.

Mission adequately managed and disposed of electronic waste

41. Electronic waste (e-waste) is generated across UNMISS locations. It includes: (a) information and communication technology equipment (e.g., personal computers, telephones, mobile phones, laptops, printers, scanners, short and long wave radios, photocopiers); (b) large and small electrical appliances (e.g., air conditioners, refrigerators, coffee machines); and (c) medical equipment (e.g., electrocardiogram units, imaging and monitoring equipment).

42. UNMISS had established a process for e-waste segregation, storage, treatment, and final disposal that involved four contractors, the Field Technology Section, Accommodation Management Unit, and PDU. For e-waste disposal, PDU submits a task order to the contractor stating the quantity and type of e-waste that requires removal and the corresponding monetary value of the e-waste. OIOS noted that the contractors who buy the e-waste are duly registered international waste disposal and recycling companies based outside South Sudan.

43. OIOS reviewed 21 task orders from March 2023 to August 2024, which indicated that a total of 38 tons of e-waste were collected from 9 locations by the contractors for disposal. OIOS also noted that DOS was developing a Global Systems Service contract to dispose of e-waste, and Missions were strongly encouraged to utilize it once awarded.

Need to operationalize the supporting infrastructure and equipment for waste management

44. The UNMISS 2020 WMP outlined the necessary infrastructure and equipment for effective waste management, including waste collection points, waste management yards, aerobic composting sites, and hazardous waste and scrap yards. The equipment list included waste bins, incinerators, encapsulators, shredders, wood chippers, and composters. The use of centralized waste management yards, equipped with various waste management tools, such as incinerators, shredders, compactors, and treatment tanks, is crucial for effective waste management solutions. Subsequently, in August 2024, UNMISS updated its WMP, detailing the infrastructure and equipment in use or required, along with their status and recommended actions for improvement. For the identified gaps, the Mission set September or October 2024 as the proposed deadline for resolution.

45. OIOS reviewed the Mission's waste management supporting infrastructure and equipment as detailed in the WMP and through field inspection visits, and made the following observations:

- Four briquette-making machines acquired before 2022 were found to be unsuitable for their intended use. UNMISS explained that this pilot project had to be abandoned because the partnership with the non-government organization that had prompted the venture had ended. However, during a field visit to Malakal, OIOS noted that the briquette machine had been installed in the waste management yard despite being non-operational.

- Eight glass pulverizers/crushers acquired in August 2023 had been distributed to various locations, but six were yet to be installed, while two had been installed but not operationalized. The biomedical incinerator in Juba and a medium incinerator in Bor had not been operationalized since 2023.

- During a field visit to Bentiu, OIOS noted that delays in constructing the waste management yard had also delayed the installation and operation of some equipment, including a multipurpose shredder (received in February 2022) and a glass pulverizer (received in August 2023). Four wastewater treatment plants in Juba have been non-functional since January 2024. Two plants at FPU K and one at FPU H were disconnected.

- In Bentiu, one of the wastewater treatment plants at Contingent J Engineering Company was not functioning because the vacuum pump had been faulty for four months. The field office had requested spare parts, including vacuum pumps, in May 2023, but these had not been supplied at the time of the audit. The Mission indicated that a contingency plan is in place when equipment is down for servicing. Sewage trucks are used to transport wastewater to other operational plants.

46. Furthermore, as of December 2024, an OIOS review of the equipment status revealed that 34 out of 123 equipment across various sites were not operationalized. Of these 34, 27 were not installed, and 7 were installed but not operational. This was due to items still in warehouses, pending infrastructure improvements like platform construction and yard extensions, and some equipment requiring operational training or electrical connections before they could be activated. The updated Mission WMP indicated that 12 waste management yards were being implemented at the following sites: UN House, Tomping, Malakal, Bentiu, Kuajok, Wau, Bor, Rumbek, Torit, Aweil, Yambio, and Yei. Failure to timely install and operationalize acquired waste management equipment could lead to equipment deterioration, increased maintenance costs, waste build-up, inefficient waste management and financial losses.

(4) UNMISS should promptly complete the implementation of the remaining waste management yards and operationalize the acquired solid waste management equipment to prevent deterioration, minimize maintenance costs and ensure efficient waste management.

UNMISS accepted recommendation 4 and stated that significant progress has been made towards addressing the challenges related to the operationalization of solid waste management equipment. Efforts are ongoing to complete the implementation of the remaining waste management yards promptly and ensure the acquired solid waste management equipment is fully operational.

UNMISS was taking steps to enhance and monitor waste reduction and minimization initiatives

47. The Waste Management Handbook highlights waste minimization initiatives and opportunities that missions are expected to implement with clear targets and timeframes in their waste management plans and updated annually. In response, the 2020 UNMISS WMP (updated August 2024), highlighted initiatives for waste reduction and minimization, which included: (a) rationalizing procurement of materials to reduce hazardous materials, (b) printing reduction initiatives, (c) discouraging the sale and use of small plastic bottles, single use cups, cutlery and plates at vendor locations on UNMISS premises; and (d) repurposing wood waste into other products. Furthermore, UNMISS had agreed to and was developing a waste minimization strategy to complement the updated WMP (2024), with a strong focus on awareness-building and stakeholder engagement. The Mission was also implementing close coordination with the Force and Police components to improve waste segregation, reduction and composting activities.

UNMISS took immediate action to commence remediation of wastewater management findings

48. Based on various observations relating to wastewater discharge, OIOS discussed several audit findings related to wastewater management, which the Mission could address to enhance work already being conducted. These included: (a) wastewater management being compromised due to clogged open drains and unconnected greywater systems at various sites in the Tomping camp mainly due to waste from upstream Juba, and not generated by the Mission; (b) improper wastewater connections in Malakal and Bentiu which led to the discharge of greywater and untreated sewage into open spaces and main drainage systems, compounded by illegal toilets and leaking septic systems; (c) wastewater from car washing bays in some contingent and police camps in both Bentiu and Malakal being discharged onto concrete and loose surfaces, and flowing into open drains without oil/water separator.

49. These issues stemmed from instances where adherence to wastewater management standards had not been fully achieved at the time of OIOS field visits. If not addressed promptly, they could pose risks of environmental pollution, including contamination of water resources, and health hazards for both the local population and Mission personnel. Due to the nature of these issues, UNMISS immediately took action to dismantle illegal toilets and fix leaking septic systems and was taking steps to address all remaining issues.

The Mission was implementing best practices and initiatives to reduce the environmental footprint

50. Mission Directive No. 2019/04 aims to reduce the environmental footprint by promoting the adoption of best practices. In 2017, the Mission introduced the Director of Mission Support Green Camp awards programme to encourage the implementation of best practices in environmental management at the camp level in line with the 2022 DOS Environmental Policy.

51. OIOS reviewed the 2022 and 2023 DOS environmental best practices case studies from field missions and periodic UNMISS EOSH bulletins and noted some best practices adopted by the Mission:

- In Torit, environmentally friendly structures were built using upcycled materials, specifically old shipping containers, thereby reducing steel waste. A central garden was also irrigated with effluent water from the wastewater treatment plant.

- In Bentiu, the field office constructed flood prevention dykes to mitigate the risk of flooding and water surges, safeguarding assets such as wastewater treatment facilities, properties, and lives.

- In Kuajok, all of the solid waste generated from July to December 2023 was managed within the compound, eliminating the need to dispose of waste at a government-approved dumpsite. Also, In Juba, UNMISS upcycled plastic bottles through collaboration with a non-governmental organization specialized in waste recycling and upcycling.

52. Identifying environmental challenges and sharing best practices supports the continuous improvement of the Mission operations. By implementing best practices, UNMISS demonstrated ongoing progress toward the commitments outlined in its environmental sustainability policy statement.

C. Environmental inspections and verification

Need to enhance environmental inspections and verifications

53. Environmental inspections are a vital component of the Mission Environmental Management System. These inspections aim to assess compliance with environmental obligations, effectively manage environmental risks, and prevent or minimize environmental impacts. Such inspections and verifications are documented using the Mission Environmental Inspection Report, which ensures efficient communication of observations, recommendations, and opportunities for improvement.

(a) Inspections and verifications coverage

54. The EOSH Unit is required to conduct environmental compliance inspections at least bi-annually for field locations with a total population greater than 300 personnel (civilian, military, and police), and annually for locations with less than 300 personnel, including an inspection of each contingent/police site within that location. The UNMISS Environmental Management System requires sections and units such as the Transport, Health Services, PDU, and Fuel Unit to conduct regular inspections related to the environmental aspects for which they are responsible. However, OIOS noted the following:

- During the audit period, the Mission conducted 41 inspections (or 43 per cent) out of the expected 96 inspections. Management explained that this period was marked by several challenges, including a reduction in flights, budgetary constraints, and a 50 per cent reduction in the human resources capacity of the EOSH team, all of which negatively impacted the ability to conduct timely inspections and verifications. However, a self-assessment template has been developed and implemented as a substitute for in-person inspections where they could not be conducted.

- Field and state environmental officers did not conduct environmental inspections at least every six months for each contingent/FPU camp within their area of responsibility, as required. UNMISS reminded the officers to ensure the inspections are conducted.

- The Transport Section, Health Services Section, PDU, and Fuel Unit did not carry out regular inspections related to the environmental aspects for which they were responsible, including vehicle maintenance workshops, PDU yards, biomedical waste incineration facilities, and fuel farms, as mandated.

(b) Delays in addressing environmental inspection and verification recommendations

55. UNMISS developed its Compliance App for environmental inspections to monitor the progress, resolutions, and recommendations of environmental issues identified during inspections. Information such as location, images, and recommendations were to be recorded in this application for access by the EOSH team, Field Engineers, and Field Administrative Officers to address issues raised and monitor environmental progress in their respective field locations.

56. The timelines for implementing recommendations are categorized into three groups: immediate, less than 30 days, and more than 30 days. OIOS reviewed the implementation of recommendations for various inspections and verifications conducted between January 2023 and April 2024. Table 2 summarizes the status of recommendations for which implementation had not been started as of 16 September 2024.

Table 2: **The status of environmental inspection recommendations as of 16 September 2024**

Status	Deadline	2023	2024	Total
Not started	Immediate	38	43	81
	< 30 days	6	2	8
	> 30 days	8	8	16
Totals		**53**	**53**	**106**

57. Out of 149 recommendations issued, 106 had a "not started" status in the environmental compliance dashboard, although 76 per cent of these were categorized as needing immediate action. UNMISS stated that action had been taken on a number of the recommendations and Field Administrative Officers and Field Engineers had been granted access to the Compliance App to track issues raised and monitor environmental progress in their respective field locations. However, they did not timely update the progress in the dashboard. Timely implementation of recommendations promotes a proactive approach to environmental management.

(c) Data completeness in the Compliance App

58. OIOS review of the completeness and reliability of the data in the Compliance App, based on inspections conducted between January 2023 and April 2024, noted the following.

- 33 (57 per cent) out of 58 inspection reports from January to June 2024 had not yet been entered into the tracking tool.

- Several relevant columns for recording locations, inspection dates, and timelines for implementing recommendations were incomplete or left blank.

59. The above occurred because UNMISS did not have an adequate mechanism to promptly follow up on the implementation of environmental inspection recommendations and ensure that the Compliance App was fully updated.

(5) UNMISS should implement a mechanism to timely follow up on the implementation of all outstanding environmental recommendations and ensure timely and complete updates in the Environmental Compliance Application.

UNMISS accepted recommendation 5 and provided evidence that since the audit fieldwork, the inspection and follow-up of recommendations for 2024 has been conducted in all but one location which was delayed due to factors beyond the control of the Environmental and Occupational Health and Safety Unit. The biannual nature of the inspections allow engagement with newly rotated contingents as well. Based on the actions taken by UNMISS and the evidence provided, recommendation 5 is closed.

IV. ACKNOWLEDGEMENT

60. OIOS wishes to express its appreciation to the management and staff of UNMISS for the assistance and cooperation extended to the auditors during this assignment.

Internal Audit Division
Office of Internal Oversight Services

ANNEX I

STATUS OF AUDIT RECOMMENDATIONS

Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[5]/ Important[6]	C/ O[7]	Actions needed to close recommendation	Implementation date[8]
1	UNMISS should: (a) take measures to ensure complete and consistent reporting of key environmental performance indicator data in the reporting dashboard; and (b) align environmental compliance thresholds with established standards in Mission Directive No. 2019/04.	Important	C	Implemented	Implemented
2	UNMISS should strengthen enforcement mechanisms to ensure standardized waste segregation across all locations and enhance strategies to promote recycling and composting.	Important	O	Receipt of evidence that enforcement mechanisms have been strengthened to ensure standardized waste segregation across all locations and enhance strategies to promote recycling and composting.	31 October 2025
3	UNMISS should develop enforcement mechanisms to ensure compliance with the hazardous waste management standard operating procedures.	Important	O	Receipt of evidence of development of enforcement mechanisms to ensure compliance with the hazardous waste management standard operating procedures.	31 October 2025
4	UNMISS should promptly complete the implementation of the remaining waste management yards and operationalize the acquired solid waste management equipment to prevent deterioration, minimize maintenance costs and ensure efficient waste management.	Important	O	Receipt of evidence of implementation of the remaining waste management yards and operationalization of acquired solid waste management equipment	31 October 2025
5	UNMISS should implement a mechanism to timely follow up on the implementation of all outstanding environmental recommendations and ensure timely and complete updates in the Environmental Compliance Application.	Important	C	Implemented	Implemented

[5] Critical recommendations address those risk issues that require immediate management attention. Failure to take action could have a critical or significant adverse impact on the Organization.
[6] Important recommendations address those risk issues that require timely management attention. Failure to take action could have a high or moderate adverse impact on the Organization.
[7] Please note the value C denotes closed recommendations whereas O refers to open recommendations.
[8] Date provided by UNMISS in response to recommendations.

APPENDIX I

Management Response

UNITED NATIONS
United Nations Mission
in South Sudan

UNMISS

NATIONS UNIES
Mission des Nations Unies
en Soudan du Sud

Date: 10 April 2025

To: Mr. Byung-Kun Min
Director
Internal Audit Division, OIOS

From: for Nicholas Haysom
Special Representative of the Secretary-General,
UNMISS

Subject: **Management Response to the Draft Report on an Audit of Waste Management in the United Nations Mission in the Republic of South Sudan (Assignment No. AP2024-633-03)**

1. UNMISS acknowledges receipt of the draft report from OIOS on Audit of Waste Management dated 13 March 2025.

2. Please find attached the Mission's management response to the recommendations stated in the said report.

4. Thank you for your consideration and support.

cc: Lt. Gen. Mohan Subramanian, UNMISS
Ms. Christine Fossen, UNMISS
Ms. Victoria Browning, UNMISS
Mr. Aggrey Kedogo, UNMISS
Mr. Qazi Ullah, UNMISS
Mr. Yonas Araia, UNMISS
Ms. Daniela Wuerz, UNMISS

APPENDIX I

Management Response

Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[1]/ Important[2]	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
1	UNMISS should: (a) take measures to ensure complete and consistent reporting of key envirinmental performance indicator data in the reporting dashboard; and (b) align environmental compliance thresholds with established standards in Mission Directive No. 2019/04.	Important	Yes	Chief ORMS	10 April 2025	The Mission accepts this recommendation. (a) During the initial discussions with the OIOS Audit team regarding the Audit of Waste Management in UNMISS, the Mission acknowledged the existence of data gaps in obtaining reliable Environmental KPI data, particularly from Force. Upon further analysis, it was determined that the reason for the inconsistent and unreliable data obtained from contingents stemmed from the fact that the unit responsible for compiling Environmental KPIs - the Environmental and OSH unit - is a civilian unit. As a result, the task of collecting and reporting monthly Environmental KPIs was not prioritized by individual TCC Units. It was therefore concluded that the responsibility for the regular collection and submission of Environmental KPIs should be formally assigned to Force HQ and disseminated through the Sector Commanders to the contingents. Accordingly, beginning in the last quarter of 2024, Force HQ, through U4 (Logistics), was tasked by the Force DCOS (SUPP), to collect Environmental KPI data from all contingents across mission locations. This data is now consolidated and shared with the Environmental and OSH via SharePoint. This revised approach has already led to a marked

[1] Critical recommendations address those risk issues that require immediate management attention. Failure to take action could have a critical or significant adverse impact on the Organization.

[2] Important recommendations address those risk issues that require timely management attention. Failure to take action could have a high or moderate adverse impact on the Organization.

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Management Response

Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[1]/ Important[2]	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
						improvement in the quality of the data received from contingents, providing a more reliable basis for conducting analysis and informing the design of targeted interventions to reduce the environmental footprint within the mission. (b) The primary platform previously used to collate Environmental KPIs was the Mission Environmental KPI dashboard/App, where data received from contingents was manually entered by Env&OSH. However, with the implementation of the revised reporting mechanism - wherein Force HQ (team U4) now submits KPI data in excel format via SharePoint - the use of the Environmental KPI App has been discontinued to avoid duplication of efforts. As a result, recommendation (b) can be considered implemented. The evidence in the form of Environmental KPI data provided by Force has been shared with OIOS as evidence of the new process. In view of these improvements, which ensure more complete and consistent reporting, the Mission will be in a position to close this recommendation as soon as possible.
2	UNMISS should strengthen enforcement mechanisms to ensure standardized waste segregation across all locations and enhance strategies to promote recycling and composting.	Important	Yes	Chief ORMS	October 2025	The Mission accepts this recommendation. The Mission is committed to strengthening mechanisms in ensuring improved environmental compliance across all locations.
3	UNMISS should develop enforcement mechanisms to ensure compliance with the hazardous waste management standard operating procedures.	Important	Yes	Chief ORMS	October 2025	The Mission accepts the recommendation.

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Management Response

Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[1]/ Important[2]	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
4	UNMISS should promptly complete the implementation of the remaining waste management yards and operationalize the acquired solid waste management equipment to prevent deterioration, minimize maintenance costs and ensure efficient waste management.	Important	Yes	Chief ORMS	October 2025	The Mission acknowledges and accepts the recommendation. Significant progress has been made towards addressing the challenges related to the operationalization of solid waste management equipment. Efforts are ongoing to complete the implementation of the remaining waste management yards promptly and ensure the acquired solid waste management equipment is fully operational. These measures are aimed at preventing equipment deterioration, minimizing maintenance costs, and enhancing the overall efficiency of waste management operations.
5	UNMISS should implement a mechanism to timely follow up on the implementation of all outstanding environmental recommendations and ensure timely and complete updates in the Environmental Compliance Application.	Important	Yes	Chief ORMS	10 April 2025	The Mission accepts this recommendation. Since the time the initial data was collected by the OIOS Team, the Mission has made significant progress in implementing and adhering to established mechanisms to ensure compliance with United Nations environmental standards. The primary compliance mechanism remains the biannual environmental inspections conducted at each location, aimed at performing risk assessments and ensuring compliance. These inspections are carried out by the Environment and OSH Unit during the January-June and July-December cycles, aligned with the COE inspection schedule (where travel permits). The inspection process is conducted in coordination with the Force Hygiene Officer and/or Field Engineer, and includes the identification of environmental risks, recommendation of action points, immediate mitigation of any significant risks, and close

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Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[1]/ Important[2]	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
						follow up with the respective contingent or Civilian camp to ensure timely implementation of corrective measures. Given the biannual nature of these inspections, the mechanism also ensures engagement with newly rotated contingents, independent contractors and National Staff. This allows the team to conduct onboarding inspections and capacity-building to address technical and knowledge gaps that could contribute to environmental risks. It is worth noting that, while compliance checks are now conducted on a regular basis, there will never be a period in which all compliance recommendations are fully closed. For a Mission of this size and complexity – operating under challenging climatic and environmental conditions - such an outcome would be unrealistic. Delays can occur due to factors beyond the Mission's control, such as procurement cycles for essential items, supply chain disruptions, delays at national borders. Nonetheless, the Mission prioritizes the immediate resolution of all significant (high risk) findings. These are escalated to Sector commanders, CLOs, and, in case of non-compliance, to Chief U4 (Logistics), and DCOS (SUPP) in Force HQ. Additionally, these high-risk compliance breaches are shared with the Field Administrative Officer (FAO), the Field Engineer, and any other relevant sections, such as Welfare or Aviation Safety, etc. In the case where resolution is delayed, the issue is brought to the attention of the Chair of the Environmental Committee (CORMS), who conveys the urgency to the appropriate section.

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Management Response

Audit of waste management in the United Nations Mission in the Republic of South Sudan

Rec. no.	Recommendation	Critical[1]/ Important[2]	Accepted? (Yes/No)	Title of responsible individual	Implementation date	Client comments
						For 2024, the Mission achieved a 100% environmental inspection visit rate, successfully identifying risks and addressing compliance issues. The evidence in the form of Inspection Reports has been shared with OIOS. In view of the demonstrated improvements in implementing a structured, timely, and effective follow-up mechanism, the Mission expects to be able to close this recommendation as soon as possible.