OFFICE OF
INSPECTOR GENERAL
U.S. DEPARTMENT OF THE INTERIOR

Audit

The National Park Service Could Improve Management of Wastewater Systems by Remediating Public Health Deficiencies and Updating Inventories and Policies

Report No. 2023-CR-026

March 2025

OFFICE OF
INSPECTOR GENERAL
U.S. DEPARTMENT OF THE INTERIOR

MAR 13 2025

Memorandum

To: Jessica Bowron
Acting Director, National Park Service

From: Kathleen Sedney
Assistant Inspector General for Audits, Inspections, and Evaluations

Subject: Final Audit Report – *The National Park Service Could Improve Management of Wastewater Systems by Remediating Public Health Deficiencies and Updating Inventories and Policies*
Report No. 2023-CR-026

This memorandum transmits our audit report on the National Park Service's management of its wastewater treatment systems, to include addressing public health and safety and the disposal of sewage sludge.

We will track open recommendations for resolution and implementation. We will notify Congress about our findings, and we will report semiannually, as required by law, on actions you have taken to implement the recommendations and on recommendations that have not been implemented. We will also post a public version of this report on our website.

If you have any questions about this report, please contact me at aie_reports@doioig.gov.

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Results in Brief

Objective

The National Park Service (NPS) manages over 1,700 wastewater systems throughout its park units to collect, treat, and dispose of wastewater—these systems range from simple outhouses, or pit privies, in the backcountry to full-scale onsite wastewater treatment plants. Our objective was to determine whether NPS effectively manages wastewater treatment systems, to include ensuring public health and safety and the disposal of sewage sludge.

Findings

We found that NPS generally manages its wastewater systems effectively but has opportunities for improvement. First, we found that NPS did not adequately remediate critical public health recommendations from its Office of Public Health (OPH).[1] This occurred because NPS does not have formal procedures that require park units to respond to or track OPH recommendations made during the course of its public health assessments. Additionally, NPS uses multiple databases for wastewater reporting and asset management, and it does not have a mechanism to track repeated deficiencies and ensure system failures are corrected. For example, in 2022, OPH identified a repeated failure at an Everglades National Park concession septic system involving sewage surfacing in a parking lot, posing immediate public health hazards and potential contamination of drinking water. At the time of our visit in 2024, the deficiencies had not yet been fully corrected.

Second, we found that NPS does not have a complete inventory of backcountry pit privies because park units did not gather and provide this data to OPH. We also found that many park units have not developed site-specific operating procedures for advanced wastewater systems that require certified operators. Specifically, out of the 30 park units we surveyed, only 3 stated they had documented operating procedures for their wastewater treatment plants. Lastly, we noted the challenges that NPS faces to recruit and retain certified wastewater operators due to park remoteness, lack of staff housing, and competition with municipal plants, which may offer higher pay.

We also identified several management practices, including technological options for wastewater operations that, if communicated and adopted more widely, could help other park units more effectively manage their wastewater systems and sewage sludge.

Impact

As of September 30, 2023, NPS reported that its wastewater systems had a replacement value of approximately $3 billion. All wastewater systems must be operated and maintained in a manner that prevents environmental contamination and adheres to health and safety standards. Failure of a wastewater system could lead to health and safety hazards, fines, visitor inconvenience, and in a worst-case scenario, environmental catastrophe. To prevent environmental contamination and health risks, NPS must properly operate and maintain its wastewater treatment and disposal systems. The responsibility for managing NPS' wastewater systems is shared between park units and OPH. Therefore, it is critical that these entities coordinate to address and monitor known deficiencies and leverage and maintain expertise. In doing so, NPS can potentially gain efficiencies to help protect the health and safety of park staff, volunteers, and visitors, as well as the environment and land entrusted to its care.

Recommendations

We make six recommendations to help NPS improve its management and oversight of wastewater systems.

[1] In its response to our draft report, NPS noted that OPH was changed to the Office of Health and Safety.

Introduction

Objective

Our objective was to determine whether the National Park Service (NPS) effectively manages wastewater treatment systems, to include ensuring public health and safety and the disposal of sewage sludge.[2]

See Appendix 1 for our audit scope and methodology. A list of NPS sites we visited and parks we surveyed can be found in Appendices 2 and 3, respectively.

Background

NPS manages over 1,700 wastewater systems throughout its park units. At the end of fiscal year (FY) 2023, NPS estimated that its wastewater systems had a replacement value of approximately $3 billion. NPS uses a variety of funding sources to address wastewater operations, maintenance, and repair or replacement projects. Aside from park units' general operations and maintenance allocation, NPS uses the Great American Outdoors Act's Legacy Restoration Fund,[3] repair and rehabilitation, and other construction or maintenance funding to address wastewater system assets.

To prevent environmental contamination and adhere to health and safety standards, NPS must operate and timely maintain these systems. NPS wastewater systems and the management of those systems vary widely from park to park based on the number of visitors, geography, and applicable State and U.S. Environmental Protection Agency (EPA) guidelines.[4] NPS Director's Order (DO) #83A, *Public Health Protection and Disease Prevention*,[5] sets forth NPS' policy and objectives to protect the health of employees, volunteers, contractors, partners, and visitors in the national parks and facilities that NPS operates, including wastewater treatment systems. NPS' *Reference Manual* (*RM*) 83A also contains comprehensive requirements, procedures, and practices to carry out its obligations to protect public health.[6]

Figure 1: Example of a Pit Privy

Source: NPS.

Wastewater System Operations

NPS uses a variety of wastewater systems to contain and treat human waste, ranging from simple outhouses or pit privies in the backcountry (see Figure 1) to full-scale onsite wastewater treatment plants that rival municipal treatment plants. An extensive network of sewer lines, septic tanks, drainfields, lagoons, and drying beds are also common wastewater system features found in NPS park units (see Figure 2).

[2] Sewage sludge refers to the solid, semisolid, or liquid residue generated during the treatment of wastewater.

[3] NPS regions and park units stated that, since the passage of the Great American Outdoors Act in 2020, the Legacy Restoration Fund has been transformational in replacing or rehabilitating NPS' critical wastewater system assets.

[4] EPA, acting through State or county primacy agencies, oversees wastewater operator certification requirements, monitors environmental impacts of wastewater systems, and issues permits where required.

[5] NPS, DO 83A, *Public Health Protection and Disease Prevention*, issued April 28, 2023.

[6] NPS, *RM* 83A, "Public Health: Protection and Prevention," issued June 20, 2019.

Figure 2: Examples of NPS Wastewater Facilities and Features

Top left: an advanced wastewater treatment plant at Everglades. Top right: a wastewater clarifier tank at Yosemite. Bottom left: an aerated settling lagoon at Yellowstone. Bottom right: sludge drying bed at Yellowstone.

Source: OIG.

NPS uses both old and new technologies to treat wastewater, and the type and scale of wastewater systems are largely determined by a park unit's unique geography, environmental resources, seasonal climate, and visitation requirements.

Once collected, human waste can be treated by means of physical separation, biological breakdown, chemical additions, or a combination of methods. Typically, NPS uses a combination of these processes to produce a final product that is tested and monitored for disposal or safe release back into the environment. If the State or EPA permits, NPS may discharge treated effluent into streams or rivers. Semisolids separated during the wastewater treatment process, also known as sludge, can be transported to a landfill outside of the park unit or treated to a biosolid[7] standard to be used for land application such as fertilizer. Alternatively, some park units located near municipalities opt to send their wastewater to the municipal treatment plant via sewer lines or truck. In general, most park units have multiple systems in place to treat and transport wastewater and sewage sludge for safe disposal.

[7] "Biosolid" refers to treated sewage sludge that meets EPA regulatory requirements for the potential use of land application.

NPS Wastewater System Management

Responsibility for NPS' wastewater systems is shared between individual park units and NPS' Office of Public Health (OPH). A team of facility managers, engineers, and utility system operators in each park unit perform the day-to-day management, operations, and maintenance of NPS' wastewater systems. In addition, consultants from NPS' OPH conduct inspections of wastewater systems, report conditions of those systems through public health assessments (PHAs), and provide technical assistance to park unit staff to ensure the wastewater systems adhere to health and safety standards and comply with EPA regulations, such as the Clean Water Act. See Figure 3 for an organization chart of the various NPS offices responsible for wastewater management.

Park Unit Wastewater Responsibilities

Facility staff at each park unit are responsible for overseeing all water and wastewater systems and ensuring they adhere to State and Federal health standards. Wastewater systems are typically managed by a team of skilled facility, utility, and maintenance staff located at each park unit.

Wastewater Terms and Definitions

A **pit privy** is a hole dug in the ground for the disposal of human waste and covered by an insect proof building.

Effluent is wastewater flowing out of a reservoir, basin, sewage treatment plant, industrial treatment plant or marine sanitation device.

A **drainfield** is an area in which effluent is released into the soil.

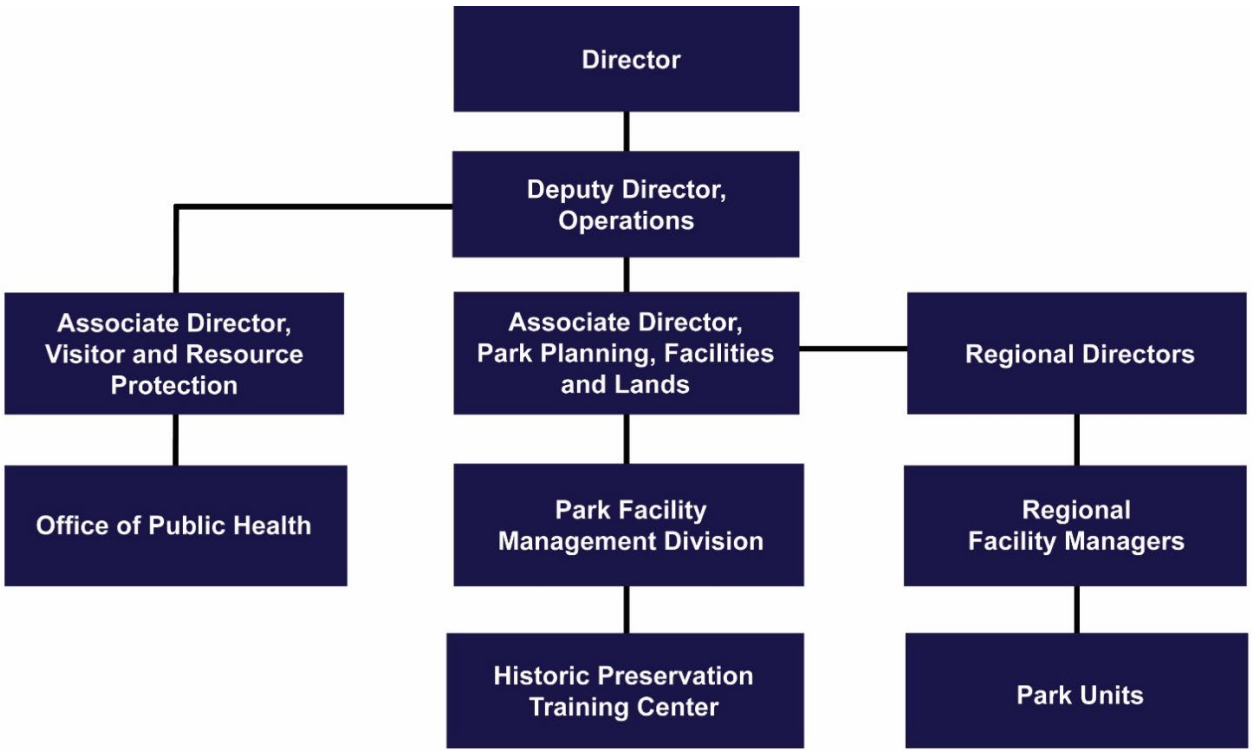
A **lagoon** is a pond containing raw or partially treated wastewater in which aerobic and/or anaerobic stabilization of solids occurs.

A **drying bed** is a holding basin where sludge is spread in a thin layer to provide sludge dewatering by allowing the liquid to drain and evaporate.

Sludge, or sewage sludge**,** refers to the semisolids separated during the wastewater treatment process.

A **vault toilet** is a toilet designed to completely retain all waste materials deposited into it.

Figure 3: NPS Units and Positions Responsible for Wastewater Management



Source: OIG.

Advanced wastewater systems, such as alternative onsite treatment and disposal systems[8] often require a certified operator to oversee wastewater operations. According to EPA standards, a park unit's primacy agency[9] determines the qualifications and training requirements for certified wastewater operators. Wastewater management and operator certification at park units that span across different State or county lines may be subject to varying regulations from multiple primacy agencies. Superintendents for each park unit must ensure that operators are certified and that wastewater operations are inspected and conducted in accordance with all applicable laws, regulations, and policies.

Regional Wastewater Responsibilities

Regional facility management staff work with park unit personnel to provide general and programmatic guidance, help determine funding eligibility for projects, and review and prioritize wastewater projects. Regional facility staff work closely with park unit managers, NPS support offices in Washington D.C, and other regional offices as well as OPH consultants to help plan, design, and construct larger wastewater projects and communicate facility management issues. Overall, regional facility staff are involved in decision making processes where appropriate, such as helping park units analyze alternatives when selecting projects and coordinating efforts to address emergencies and unforeseen costs associated with park wastewater systems. Regional facility management staff also prioritize and authorize funding for deferred maintenance and repair projects.

Park Facility Management Division Wastewater Responsibilities

NPS' Park Facility Management Division (PFMD) is one of six divisions under the Park Planning, Facilities and Lands directorate. The Park Planning, Facilities and Lands directorate provides leadership; policy development; program accountability and budget formulation for planning, design, and construction; and park facility and land management. PFMD provides guidance, technology and tools, funding, technical assistance, and training to parks in the areas of asset management, transportation, sustainability, accessibility, and employee housing. Through its Asset Management Program Branch, PFMD manages the data and business practices associated with NPS' wastewater systems, including (1) work order data in the Facility Management Software System (FMSS) and (2) facility condition and deferred maintenance and repair data reported in NPS' Federal Real Property Profile (FRPP).

NPS' Office of Public Health Wastewater Responsibilities

NPS has a partnership with the U.S. Public Health Service and the U.S. Department of Health and Human Services in an effort to promote visitor and public health. Through a memorandum of agreement, Commissioned Corps public health officers are assigned to NPS' OPH. Along with providing technical advice and consultation for an extensive list of health and safety issues, OPH consultants also conduct inspections of food, water, and wastewater systems at each park unit. Specifically, OPH consultants assist park units by conducting inspections and developing PHA reports on the operation and maintenance of wastewater systems. OPH consultants conduct inspections and complete their assessment report "on a routine basis" to identify and correct deficiencies and mitigate risk for disease transmission.[10]

When OPH consultants identify a potential issue during an inspection, they assign a deficiency level ranked from 1 to 5, with level 5 deficiencies being the most critical risk to public health. OPH consultants stated that level 4 and 5 deficiencies should be addressed as soon as possible. After performing their inspections, OPH consultants summarize their findings in PHA reports to identify deficiencies, mitigate health risks, and

[8] Alternative onsite treatment and disposal systems include components different from those used in a conventional septic tank and drainfield system. An alternative system is used to achieve acceptable treatment and dispersal or discharge of wastewater where conventional systems may not be capable of meeting established performance requirements to protect public health and water resources (for example, at sites where high groundwater, low-permeability soils, shallow soils, or other conditions limit the infiltration and dispersal of wastewater or where additional treatment is needed to protect groundwater or surface water quality).

[9] The primacy agency is a Federal, State, or county agency that the EPA has authorized to administer Federal regulations. If a State has not requested this authorization, the EPA is the primacy agency.

[10] DO 83A, Sections 1.1 and 3.2.

make recommendations to park units for corrective action. Once a PHA report is completed, OPH consultants provide the reports to the park unit's leadership and regional facilities management.

Tracking and Monitoring Wastewater Systems

NPS facility staff use FMSS to develop, track, and monitor work orders associated with wastewater systems. Park units or regional facility managers may bundle related work orders to create a larger project for review and funding consideration.

OPH consultants use their own database, the Office of Public Health Information System (OPHIS), to collect information about NPS' food, water, wastewater, and other health and safety topics OPH oversees. OPH consultants use OPHIS wastewater information to aid in their inspections of wastewater systems and development of PHAs.

Separate from FMSS and OPHIS, PFMD tracks the condition of wastewater systems through parametric condition assessments, which NPS uses to determine each assets' deferred maintenance and repair costs. NPS reports these costs in its FRPP, which is used to inform the U.S. Department of the Interior's annual Agency Financial Report.[11] As of FY 2023, NPS estimated the cost to address its wastewater-related deferred maintenance across all its regions to be approximately $877 million (see Figure 4).

Figure 4: NPS Wastewater Systems' Deferred Maintenance and Repairs by Region (as of FY 2023)

Region	Wastewater Systems	Deferred Maintenance and Repairs
Pacific West	408	$462,029,967
Intermountain	443	$297,291,854
Northeast	212	$42,562,315
Southeast	382	$42,391,242
Midwest	212	$25,746,481
National Capital	48	$6,120,917
Alaska	51	$837,637
Totals	**1,756**	**$876,980,412**

Source: NPS PFMD.

[11] The Department of the Interior's Agency Financial Reports are available at https://www.doi.gov/pfm/afr.

Results of Audit

We found that NPS generally manages its wastewater systems and sewage sludge effectively, but there are opportunities for improvement.

First, we found that NPS park units did not adequately remediate critical public health recommendations from OPH consultants because NPS:

- Does not require park units to respond to PHAs and follow up on recommendations.
- Does not have a mechanism to track public health recommendations.
- Has reduced the frequency of OPH health and safety inspections.

As a result, NPS places a heavy reliance on relationships between park units and OPH consultants to remediate deficiencies.

Second, we found that NPS did not have complete wastewater information about pit privies[12] because park units did not gather this data. Having unmonitored, large-capacity pit privies in the backcountry could potentially violate EPA regulations and increase the risk to drinking water resources and public health.

Third, we found that many park units did not have site-specific procedures for operating and maintaining their advanced wastewater treatment systems. Specifically, out of the 30 park units surveyed, only 3 stated they had site-specific procedures for their wastewater systems, and 1 other park unit told us it was in the process of developing procedures for its wastewater systems. In the absence of documented wastewater system procedures, new operators may not have access to basic operating, maintenance, or emergency processes.

We also note the challenges that NPS faces to retain certified wastewater operators, which make written procedures essential for continuity of operations and preservation of knowledge and workflows. We identified several management practices that park units have implemented that, if communicated and adopted more widely, could help other park units more effectively manage their wastewater systems and sewage sludge.

[12] *RM* 83A defines a [pit] privy as "a hole dug in the ground for the disposal of human waste and covered by an insect proof building."

Inadequate Response to Critical Health and Safety Recommendations

NPS' *Management Policies 2006*,[13] DO 83A, and *RM* 83A address the importance of collecting current and accurate public health information to address deficiencies and mitigate risks. For example, NPS' *Management Policies 2006* states that NPS will identify public health issues in the parks and conduct park operations in ways that reduce or eliminate hazards.[14] DO 83A states that OPH consultants will collect and analyze data to address public health issues and mitigate or eliminate associated hazards in accordance with public health and privacy laws.[15] It also states that superintendents and unit managers will "correct deficiencies and mitigate risks identified by public health consultants during periodic assessments and close NPS facilities and property . . . as necessary, to prevent the spread of disease."[16]

Likewise, *RM* 83A authorizes OPH consultants to address public health issues and reduce or eliminate associated hazards[17] while also stating that NPS unit managers must "reduce the risk of waterborne disease and provide safe wastewater disposal by ensuring wastewater systems are properly operated, maintained, monitored, and deficiencies promptly corrected."[18]

Furthermore, the U.S. Government Accountability Office (GAO) emphasizes the importance of defined procedures to correct deficiencies when found. In its *Standards for Internal Control in the Federal Government*, GAO states that "management should implement control activities through policies, which are further defined through procedures that include any followup corrective actions to be performed by personnel if deficiencies are identified." NPS policy states that "[i]nstructions, guidance, and directives of regional or otherwise-limited application supplementary to and in conformance with Service-wide policies may be issued by regional directors or associate directors within formal delegations of authority." It also states that "[s]uperintendents may issue, within formal delegations of authority, park-specific instructions, procedures, directives, and other supplementary guidance."[19]

We found that, in response to OPH's PHAs, NPS park units did not adequately remediate critical public health recommendations. To aid us in determining the extent to which parks manage and address health and safety issues related to wastewater systems, we conducted a survey of the 30 park units that we identified as having advanced wastewater treatment systems. Specifically, we reviewed the most recent PHA for each park unit that we surveyed to determine the status of the wastewater systems and identify any repeated critical deficiencies, specifically those ranked as level 4 or 5.[20] We focused on these deficiencies as they pose the highest risks to public health and should be addressed as soon as possible. In the 30 PHAs we reviewed,[21] OPH consultants identified 87 level 4 or 5 wastewater deficiencies, 63 of which were listed as repeated.[22] These deficiencies included issues such as permit violations for effluent discharge, sewage spills, and other wastewater system failures. See Figure 5 for the repeated public health deficiencies by location.

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[13] NPS' *Management Policies 2006* can be found at https://www.nps.gov/subjects/policy/management-policies.htm.

[14] NPS' *Management Policies 2006*, Section 8.2.5.5.

[15] DO 83A, Section 4.3.

[16] DO 83A, Section 4.12.

[17] *RM* 83A, Chapter 6, Section 2.

[18] *RM* 83A, Chapter 2, Section 1.1.

[19] NPS' *Management Policies 2006*, "Introduction," "Other sources of Guidance," p. 5.

[20] As noted earlier, when OPH consultants identify a potential issue during an inspection, they assign a deficiency level ranked from 1 to 5, with level 5 being the most critical risk to public health. OPH stated that level 4 and 5 deficiencies should be addressed as soon as possible.

[21] See Appendix 3 for the list of park units we surveyed.

[22] As noted in Figure 5, 40 of the 63 repeated level 4 or 5 deficiencies were related to Cape Cod National Seashore cesspools located in residential units.

Figure 5: Total and Repeated Level 4 and 5 Deficiencies by Park Unit*

Park Unit	Total	Repeated	Description
Acadia National Park	1	0	Discharge permit violations
Big Bend National Park	4	4	Valve and pipe corrosion
Buffalo National River	3	1	Failing drainfields
Cape Cod National Seashore	40	40	Unapproved cesspools
Dry Tortugas National Park	1	0	System at end of life
Everglades National Park	1	1	Septic failure and standing sewage
Flight 93 National Monument	1	1	Discharge permit violations
Glacier National Park	3	0	Septic failure and flooding
Grand Canyon National Park	2	0	Lift station and sewer line failures
Grand Teton National Park	7	6	Sewage spills, septic failure, and pipe corrosion
Isle Royale National Park	4	0	Sewer line blockage, septic required pumping, unapproved cesspool, failing drainfield
Mesa Verde National Park	1	0	Septic failure
Mount Rainier National Park	2	0	Sewage spills
New River Gorge National Park	3	3	Septic cracks and retaining wall instability
Olympic National Park	1	0	Inadequate signage
Great Smoky Mountains National Park	4	1	Possible septic failure and inflows exceed design
Virgin Islands National Park	2	0	Potential groundwater contamination and septic required pumping
Whiskeytown National Recreation Area	1	0	Septic required pumping
Yellowstone National Park	6	6	Corrosion may lead to failures, high ammonia
Totals	**87**	**63**	

* This table does not include surveyed park units that did not have reported level 4 or 5 deficiencies.

Source: OIG.

To illustrate an example of a repeated deficiency, in a 2021 assessment, OPH consultants identified a repeated level 4 deficiency originally identified in 2019 at the Thurmond Depot Wastewater Treatment Plant in New River Gorge National Park and Preserve. Specifically, OPH consultants noted that a retaining wall at the plant had structural issues and expressed fear of a future collapse of this retaining wall, which would destroy the wastewater treatment plant and send the northwest side of it over the cliff toward the New River. In May 2024, OPH consultants found the deficiency again and noted potential long-term solutions, but recommended the park conduct a structural assessment and stabilize the retaining wall in the interim.

In 2022, OPH consultants found that Everglades National Park and one of its concessionaires had not corrected a septic system failure originally identified in a 2021 PHA. Specifically, OPH consultants found sewage surfacing from a septic tank's drainfield into a parking lot, posing immediate public health hazards and potential drinking water contamination. After the repeated deficiency was identified in 2022, OPH consultants coordinated with the park and recommended closure of specific operations. OPH consultants briefed the park and concessions on

potential short- and long-term solutions and recommended that a new wastewater system be installed. However, as of our visit to the park in February 2024, the septic system failure was still not fixed, and the area was closed. The park attributed the delays to the concessionaire who, according to park officials, had not been responsive to NPS' requested corrective actions.

In another 2022 PHA, OPH consultants found a repeated level 4 deficiency with Yellowstone National Park's lift station at Old Faithful,[23] which is used to pump wastewater. The consultant noted that, since the lift station does not have an overflow tank, raw wastewater may overflow onto the trail to Old Faithful if the lift station fails. As of our visit to the park in September 2023, the lift station deficiency still existed, but the park had plans to address the lift station using funds allocated to rehabilitating Old Faithful's wastewater system for FYs 2023 through 2025. Figure 6 shows the interior of the Old Faithful Lift Station taken during our site visit.

Figure 6: Interior of Old Faithful Lift Station, Yellowstone

Source: OIG.

In 2023, OPH consultants found four repeated level 4 deficiencies at Big Bend National Park involving heavy valve and pipe corrosion at its Rio Grande Village and Chisos Basin facilities that were first reported as early as 2021 and could lead to immediate system failures. After we followed up with NPS on these concerns, it noted that the repeated corrosion deficiencies at the Rio Grande Village and Chisos Basin facilities had been addressed.

The repeated deficiencies and lack of followup occurred, in part, because NPS does not have formal procedures in place that require park units to remediate the deficiencies that OPH consultants identify. NPS officials stated that if an OPH consultant identifies a level 4 or 5 deficiency, OPH works with the park unit and region staff to address the issue. OPH consultants stated that there are no mandatory requirements for a park unit to mitigate or correct an issue and that the ultimate authority to address any deficiency rests with the superintendent of each park unit. According to OPH, it acts in a consulting or advisory role to provide support, training, and technical advice to parks on regulatory and public health and safety issues. For example, OPH consultants "advise park managers on public health risks that warrant closure of NPS property or facilities . . . to protect public health."[24] Because it is limited in its role, OPH lacks the authority to require or mandate that park units address the public health and safety concerns that OPH consultants identify in PHAs. Instead, OPH relies on park unit staff to address the identified deficiencies.

Repeated deficiencies and lack of followup also occurred because NPS does not have a mechanism to track deficiencies that OPH identifies. OPH consultants acknowledged that neither they nor facility managers knew how many critical deficiencies identified in PHAs were repeated. Despite having related oversight responsibilities for NPS wastewater systems, OPH consultants and facility staff use different databases for different purposes and for compiling information regarding the same wastewater systems. Specifically, OPH consultants use OPHIS to compile wastewater system information related to their inspections, while facility staff use FMSS to create work orders to maintain or repair the systems. According to NPS officials, neither OPHIS nor FMSS were set up to share information automatically, and there is no alternative system in place that reconciles public health information with facilities or work order information. However, we found that these two existing systems use common identifying data (e.g., asset identification numbers and system descriptions) that may be used to reconcile asset data and track wastewater system deficiencies.

Additionally, OPH consultants stated that, due to staff and budget restrictions, OPH has had to reduce the number of PHAs it conducts, making recommendation followup an increasingly critical component to

[23] Based on the Yellowstone PHAs reviewed, we were unable to determine when OPH consultants originally reported this deficiency.

[24] DO 83A, Section 4.4.

wastewater system monitoring. The repeated critical deficiencies and recommendations from OPH highlight the need for continuous monitoring of deficiencies and formal followup of recommendations. However, the lack of formal procedures, ability to track deficiencies, and reduced number of PHAs conducted place a heavy reliance on relationships between park units and OPH consultants. These relationships may or may not be effective based on differing priorities, staff turnover, and OPH's lack of authority to enforce change. By addressing these issues, both NPS park units and OPH consultants could benefit in their related oversight responsibilities. Specifically, a mechanism to track wastewater system deficiencies would benefit OPH consultants during their inspections of wastewater systems while better informing NPS facilities staff of public health issues not regularly captured in day-to-day maintenance activities. These efforts may also assist park units when requesting funding to address known deficiencies by documenting wastewater system issues and prioritizing projects that address repeated critical deficiencies. Overall, improved, formalized procedures, tracking mechanisms, and increased oversight will help protect the health and safety of park staff, volunteers, and visitors as well as the environment and land entrusted to its care.

Recommendations

We recommend that NPS:

1. Develop and implement a policy that requires park units to respond to public health assessments, including planned corrective actions and interim mitigation of all level 4 and 5 deficiencies.

2. Develop and implement a mechanism for tracking and remediating wastewater system deficiencies and public health recommendations reported in Office of Public Health assessments.

Incomplete Inventory of Backcountry Pit Privies and Cesspools

Based on design and daily usage, some NPS pit privies may be categorized as cesspools, which are defined as covered, open joint, walled pits that receive raw sewage. Cesspools do not treat waste in the same way a septic system provides treatment and could allow contaminants to flow into the ground water. If backcountry pit privies (see Figure 7) or cesspools have the potential to service 20 or more persons per day, they are considered nonresidential large-capacity cesspools and are banned by the EPA. Specifically, under authority provided in the Safe Drinking Water Act (SDWA),[25] the EPA banned all large-capacity cesspools and required them to be closed by 2005 to protect underground sources of drinking water.[26]

DO 83A states that "NPS backcountry and wilderness operations, including sanitary facilities, will be maintained at the minimum level necessary to meet a park's backcountry and wilderness management objectives and to provide for the

Figure 7: Examples of Backcountry Privies

The privy on the left would be banned under the EPA's definition of a large-capacity cesspool if used by more than 20 people per day. The privy on the right would not be banned based on its design and unique way of treating waste.

Source: NPS.

[25] The SDWA was established to protect the quality of drinking water in the United States and covers all waters actually or potentially designated for drinking use, whether above or below ground. Under the SDWA, the EPA established standards for States to regulate public drinking water systems and protect underground sources of drinking water from endangerment.

[26] The EPA banned large-capacity cesspools because untreated sanitary waste from cesspools can enter ground water and contaminate drinking water sources. https://www.epa.gov/uic/large-capacity-cesspools.

health and safety of park visitors."[27] However, because they exist in remote areas and NPS has not provided OPH with an inventory and locations of all backcountry pit privies, OPH consultants have not been able to determine whether pit privies located in the backcountry qualify as nonresidential large-capacity cesspools subject to the EPA's 2005 ban.

In 2018, OPH initiated an effort to collect and assess backcountry pit privy data to ensure NPS facilities do not violate the EPA's 2005 rule. During that time, OPH developed and sent an inventory form, called the "Privy Information Request," to all NPS park units. However, according to the OPH consultant that was leading the effort to collect more information on NPS' backcountry privies, NPS never provided the requested information to OPH.

Without an accurate inventory and assessment of pit privies, NPS may be violating EPA regulations and potentially increasing the risk to drinking water resources and public health. NPS risks receiving orders or penalties from the EPA if large-capacity cesspools are discovered and not closed. For example, the EPA required the U.S. Forest Service to close 62 campground pit toilets at 7 national forests across California because they were classified as large-capacity cesspools. By proactively addressing this issue and determining whether large-capacity cesspools exist, NPS can better prevent risks to public health and safety.

Recommendations

We recommend that NPS:

3. Require park units to inventory all backcountry pit privies.
4. Determine whether any backcountry pit privies qualify as large-capacity cesspools and close them as required.
5. Develop procedures to periodically inventory backcountry pit privies and determine if they are large-capacity cesspools and should be closed.

Park Units Lack Site-Specific Operating Procedures for Wastewater Systems

GAO's *Standards for Internal Control in the Federal Government* states that "management is responsible for designing the policies and procedures to fit an entity's circumstances and building them in as an integral part of the entity's operations." Additionally, NPS' *Management Policies 2006* allows superintendents to issue "park-specific instructions, procedures, directives, and other supplementary guidance."[28] We found that many park units with advanced wastewater treatment systems operated by certified wastewater operators do not have documented procedures in place. These advanced wastewater systems are complex, unique, and technical and often require a certified wastewater operator. Generally, operating procedures would include information pertaining to the overall wastewater treatment process and procedures (such as maintenance routines, sampling and handling, and inspection expectations), roles and responsibilities, criteria, checklists, equipment and supply specifications (for example, chemicals used in the process), and health and safety precautions that are specific to that site's systems.[29]

[27] DO 83A, Section 3.4.6. "The NPS uses the term 'backcountry' to refer to primitive, undeveloped portions of parks. Backcountry is distinct from wilderness. For NPS policies and purposes, 'wilderness' includes the categories of eligible, proposed, recommended, and designated wilderness. Potential wilderness may be a subset of any of these categories." See footnote no. 2 of DO 83A.

[28] NPS' *Management Policies 2006*, "Introduction," "Other sources of Guidance," p. 5.

[29] The EPA's Quality Assurance (QA) *Guidance for Preparing Standard Operating Procedures (SOPs)* (QA/G6), dated April 2007, is available at https://www.epa.gov/sites/default/files/2015-06/documents/g6-final.pdf.

We surveyed the 30 park units we identified as having an advanced wastewater treatment system and asked each park unit to provide park-specific procedures related to emergency, strategic, risk, and asset management of its wastewater systems. Out of the 30 park units we surveyed, only 3 stated that they used documented procedures to operate and maintain their advanced wastewater systems, and 1 stated it was in the process of developing procedures. Additionally, in response to our site visit inquiries, a fourth park developed and provided operating procedures for its wastewater treatment plants following our visit.

Most of the park units we surveyed referred to the primacy agency's regulations or DO 83A and *RM* 83A as procedures. However, the criteria in these documents are not specific to individual wastewater systems. For example, Section 7 of *RM* 83A, "Wastewater System Operational Requirements," states that the provided guidelines are not all-inclusive and do not address proper operating procedures for advanced treatment systems.[30] Aside from stating that manufacturer's operation and maintenance manuals should be consulted for advanced systems, NPS policy falls short of requiring park units to develop their own site-specific procedures for advanced wastewater treatment systems.

Due to the unique nature of each wastewater system throughout NPS park units, especially those requiring certified operators, it is important for each park unit to have procedures for each of their advanced treatment systems. Site-specific procedures not only benefit current wastewater staff but also assist in transferring institutional knowledge to new staff and operators. During interviews with wastewater staff at various park units and regions, NPS officials noted the potential benefits of developing operating procedures for wastewater systems. For example, park officials stated that having procedures would be of value to existing wastewater staff, trainees, and new operators. One facility manager acknowledged that his team relies on the knowledge of the existing staff to operate their wastewater systems and that written procedures would allow that knowledge to be transferred to future generations of wastewater staff. Furthermore, park officials stated that it would be helpful if procedures were developed in a standardized format to create consistency between parks so that wastewater operators would be familiar with where to find certain operational information if transferred to a different park. During our audit, NPS facility staff at all levels said retention and recruitment of wastewater operators is a significant management challenge, making site- and system-specific procedures even more important as turnover of wastewater staff occurs.

Recommendation
We recommend that NPS: 6. Update its policies to require park units to develop procedures for each advanced wastewater system requiring a certified wastewater operator.

[30] Examples of advanced treatment systems include activated sludge plants, trickling filters, tertiary treatment, sludge digestion, physical chemical treatment, etc. (*RM* 83A, Section 7.1).

Other Matters

We found that, in its efforts to operate and maintain systems to treat and dispose of wastewater and follow best management practices, NPS park units faced challenges or employed alternative practices in managing wastewater systems that may warrant NPS attention. However, we do not propose specific recommendations for NPS in these areas.

Operator Retention Challenges and Opportunities

During our audit, NPS facility staff at all levels highlighted recruiting and retaining wastewater operators as a significant management challenge.[31] These challenges have also been noted throughout the water and wastewater industry. According to a 2020 EPA report,[32] approximately one-third of drinking water and wastewater operators in the United States will be eligible to retire in the next 5 to 10 years, and the water and wastewater industry has been facing retention challenges. Similarly, the U.S. Bureau of Labor Statistics stated that employment of water and wastewater treatment system operators was projected to decline 6 percent from 2023 to 2033. During this time, there will be a projected average of 10,300 openings each year for water and wastewater treatment plant and system operators—stemming from the need to replace workers who transfer to other occupations or exit the labor force, such as through retirement.[33]

To illustrate, a regional facility manager stated that his team had recently lost a wastewater operator to a higher paying job at a municipal wastewater treatment plant. The facility manager stated that it is not uncommon for NPS to spend significant time and resources in hiring and training individuals to become wastewater operators only for them to leave NPS for better paying jobs at municipal plants. At another park we visited, the facility manager stated that the park was unsuccessful in filling a wastewater operator position because the selected applicant had accepted a higher paying job before NPS' onboarding process was completed. Other park units mentioned that recruiting staff had become increasingly difficult due to park remoteness, the lack of staff housing, and rising costs of living in nearby towns. Furthermore, NPS officials stated that transferring certified wastewater operators within NPS is difficult due to variances between States' certification requirements.

Despite the recruitment and retention challenges that NPS faces for wastewater operators, we found that NPS was aware of the situation and had taken steps to address recruitment and retention issues. For example, NPS staff at PFMD, the Historic Preservation Training Center (HPTC), and regional facility staff collaborated with the Human Resources Division to evaluate how wastewater operator positions could be filled in a timelier manner. We also found that some park units took advantage of providing group or individual pay incentives (up to 25 percent per year for four years) for qualified wastewater system staff to compete with local pay rates for operators. One park we visited was also evaluating options to lease affordable housing for its staff in neighboring towns.

While some of these issues are not uncommon when recruiting or retaining staff in general, the training, certification, and significant regulatory requirements governing the operation of wastewater systems increases the importance of these positions to NPS. Widely communicating the availability of these types of incentives may help NPS address its operator retention concerns.

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[31] In our *Flash Report: The National Park Service's Inflation Reduction Act Hiring Efforts and Activities* (Report No. 2024-ISP-011), issued August 2024, we reported on NPS hiring challenges and $500 million in Inflation Reduction Act funding that NPS plans to use to address these challenges. https://www.doioig.gov/reports/flash-report-national-park-services-inflation-reduction-act-hiring-efforts-and-activities.

[32] EPA, *America's Water Sector Workforce Initiative: A Call To Action*, issued 2020. https://www.epa.gov/sustainable-water-infrastructure/americas-water-sector-workforce-initiative.

[33] U.S. Bureau of Labor Statistics' *Occupational Outlook Handbook,* "Water and Wastewater Treatment Plant and System Operators," can be found at https://www.bls.gov/ooh/production/water-and-wastewater-treatment-plant-and-system-operators.htm#tab-6.

Promising Training and Management Practices

HPTC is responsible for the safe preservation and maintenance of national parks or partner facilities in part by developing educational courses that fulfill the competency requirements of employees in the career fields of historic preservation, maintenance, planning, design, and construction.

HPTC, in conjunction with OPH, initiated a pilot training program in 2023 for new and existing wastewater staff. HPTC held trainings at Yosemite National Park and Cape Hatteras National Seashore in 2023, and it had plans to expand this training to other locations in 2024. Although this training is new, it shows initiative by NPS to help its wastewater operators obtain continuing education to meet wastewater operator certification requirements. This training also provides an avenue for wastewater staff to collaborate and discuss issues related to the day-to-day operations and maintenance of wastewater systems.

Furthermore, HPTC stated that it contracted a review of the different State certifications and training requirements for certified wastewater operators in an effort to ensure States will accept the continuing professional education credits toward certification. HPTC told us that it has yet to experience issues with a State accepting the training credits it offers since it structures its training topics around requirements from States with the most rigorous environmental standards, such as California.

HPTC has also contributed to recruiting and developing interns through the Traditional Trades Advancement Program,[34] which can particularly benefit park units interested in recruiting new wastewater operators. HPTC staff members told us they are hoping to use the program to support development of a water and wastewater internship and that they are working with park units to finalize potential placements.

In addition to HPTC training wastewater operators and providing credit toward State certification requirements, HPTC is also in a unique position to help NPS identify emerging technologies or practices. For example, in one of HPTC's wastewater treatment training modules it asks participants to share and discuss issues they have had with onsite wastewater treatment systems. Similar class discussions could be centered around what practices have worked best to address such issues. We encourage HPTC to continue developing its wastewater operator training program and to identify and communicate management practices and NPS guidance associated with wastewater system operations and sludge management. For example, HPTC trainings may encourage sharing and implementing wastewater or sludge management lessons learned or emerging technologies, such as surveying sludge holding lagoons to maximize holding capacity and using dewatering systems to reduce costs associated with transport and disposal of sewage sludge. These practices, if implemented widely, could help park units improve their wastewater management.

For example, we visited one park that installed a dewatering system for processing sewage sludge after treatment (see Figure 8). According to park officials, this system enabled the park to dry and treat their sewage sludge to a low-grade

Figure 8: Sludge Dewatering System

A dewatering system used to treat sludge (left) and the sludge treated to biosolid standard that results (right).

Source: OIG.

[34] NPS HPTC, *Traditional Trades Advancement Program*, https://www.nps.gov/orgs/1098/traditional-trades-apprenticeship-program.htm.

biosolid standard, reducing the water content and weight of the product thereby reducing the cost of hauling it away (see Figure 9). The facility manager at that park said that the new dewatering system reduced the weight and volume of their sewage sludge by up to 70 percent.

That same park also used a third-party contractor to transport its dried sewage sludge to local farmlands for further treatment and application. For comparison, at another park we visited, we learned that the park recently spent around $800,000 to pump and haul approximately 20 years of sewage sludge to a landfill over 150 miles away. The park cited the cause as limited funding and underestimating project budgets for its new wastewater system, which, according to park officials, forced it to forgo a planned dewatering system. An NPS engineer familiar with sludge management suggested to us that NPS evaluate mobile dewatering systems (see Figure 10) as a management practice that could help reduce overall costs of treating and disposing of its sewage sludge.

Figure 9: Dried Sludge Loaded for Transportation, Yosemite

Source: OIG.

Figure 10: Mobile Dewatering System Used at Yellowstone

Source: NPS.

Conclusion and Recommendations

Conclusion

We found that NPS generally manages its wastewater systems and sewage sludge effectively. However, we found that:

- NPS did not adequately remediate critical public health recommendations from OPH.
- NPS did not have a complete inventory of backcountry pit privies or cesspools.
- Most parks do not have site-specific operating procedures for their advanced wastewater treatment systems, despite the unique nature of these systems and challenges to retain certified wastewater system operators.

As a result of these findings, there is an overall increased risk to NPS' wastewater infrastructure and the health of its employees and the visiting public.

We make six recommendations to help NPS improve its management and oversight of its wastewater systems.

Recommendations Summary

We provided a draft of this report to NPS for review. NPS concurred with all six recommendations. We consider all recommendations resolved. We determined that Recommendations 1 and 2 are significant and will be reported as such in our semiannual report to Congress in accordance with the Inspector General Act.[35] Below we summarize NPS' response to our recommendations, as well as our comments on its responses. See Appendix 4 for the full text of NPS' response; Appendix 5 lists the status of each recommendation.

We recommend that NPS:

1. Develop and implement a policy that requires park units to respond to public health assessments, including planned corrective actions and interim mitigation of all level 4 and 5 deficiencies.

   NPS Response: NPS concurred with this recommendation and agreed to update both the Public Health Information System (PHIS)[36] and related policies. The planned PHIS update would "enable park managers to view, understand, and address deficiencies more effectively." The planned application update would "allow park managers to report the status of corrective actions for level 4 and 5 deficiencies," and NPS stated it will provide more clarity and consistency when identifying deficiency levels. NPS plans to update its *RM* 83A "to include the new reporting practices, and policies will be updated to ensure parks address critical deficiencies promptly." NPS also committed to develop interim mitigation measures to restrict or cease the operations of wastewater systems identified as critically deficient on a case-by-case basis until corrective actions can be taken. NPS provided additional information about mitigating measures after its formal response to our draft report. Specifically, NPS stated:

   > Parks will receive a written public health report after each wastewater inspection. Until the Public Health Information System is developed and can facilitate reporting in a database, parks are required to report their corrective actions for any identified critical

[35] The Inspector General Act of 1978, 5 U.S.C. § 405(b), requires inspectors general to prepare semiannual reports summarizing OIG activities during the immediately preceding six-month periods ending March 31 and September 30. It also states that these semiannual reports should include an identification of each "significant recommendation" described in previous semiannual reports on which corrective action has not been completed.

[36] In our report, we refer to this system as the Office of Public Health Information System, or OPHIS, as NPS used this terminology at the time of our audit.

> deficiencies (levels 4 or 5) using a temporary . . . site set up by the Office of Health and Safety (OHS). Parks must submit their corrective action plans within 30 calendar days of receiving the PHA report from OHS. These actions will be stored on the . . . site and can be updated by the parks as a temporary measure until the database is completed.

NPS provided an April 3, 2026 target implementation date.

OIG Comment: Based on NPS' initial response and additional information provided, we consider this recommendation resolved. We will consider it implemented when NPS provides evidence demonstrating that it has updated PHIS and *RM* 83A to require parks to respond to public health assessments and correct deficiencies.

2. Develop and implement a mechanism for tracking and remediating wastewater system deficiencies and public health recommendations reported in Office of Public Health assessments.

   NPS Response: NPS concurred with this recommendation and referred to its corrective actions to address Recommendation 1. NPS also stated that it will update PHIS to include a module to establish timelines for corrective actions and "facilitate the tracking of all deficiencies identified during inspections and provide a system for notifying parks of these deficiencies." As noted in response to Recommendation 1, NPS provided additional information about mitigating measures after its formal response to our draft report. Specifically, NPS stated that parks are required to report their corrective actions for any identified critical deficiencies within 30 calendar days of receiving the PHA report from OHS. These actions will be stored on the site and can be updated by the parks as a temporary measure until the PHIS database is completed. NPS provided an April 3, 2026 target implementation date.

   OIG Comment: Based on NPS' initial response and additional information provided, we consider this recommendation resolved. We will consider it implemented once NPS provides evidence demonstrating that the updates allow parks and public health officials to effectively track wastewater system deficiencies.

3. Require park units to inventory all backcountry pit privies.

   NPS Response: NPS concurred with this recommendation and stated that OHS (formerly OPH) is collaborating with the Park Planning, Facilities and Lands directorate "to complete an inventory of all pit privies in the front country and backcountry." NPS provided a June 20, 2025 target implementation date.

   OIG Comment: Based on NPS' response, we consider this recommendation resolved. We will consider it implemented when NPS provides the results of its completed inventory.

4. Determine whether any backcountry pit privies qualify as large-capacity cesspools and close them as required.

   NPS Response: NPS concurred with this recommendation and stated that it "will develop guidance on how to evaluate the size and usage of pit privies, criteria for when they must be closed, and track the closure." NPS provided a June 20, 2025 target implementation date.

   OIG Comment: Based on NPS' response, we consider this recommendation resolved. We will consider it implemented when NPS provides evidence demonstrating that it has developed and implemented the guidance based on the results of the pit privy inventory.

5. Develop procedures to periodically inventory backcountry pit privies and determine if they are large-capacity cesspools and should be closed.

   NPS Response: NPS concurred with this recommendation and stated that it "is currently reviewing and updating its pit privy inventory to accurately identify and categorize facilities that qualify as

large-capacity cesspools." NPS provided additional information about maintaining its inventory after its formal response to our draft report. Specifically, NPS stated that it will develop a dashboard to maintain accurate inventory count, while implementing a new field in FMSS to track the status of pit privies (i.e. active or closed). NPS also stated that parks will update, review, and certify the accuracy of pit privy inventories by the end of September each year. NPS provided a June 20, 2025 target implementation date.

OIG Comment: Based on NPS' initial response and additional information provided, we consider this recommendation resolved. We will consider it implemented once NPS provides evidence demonstrating that it has developed the associated procedures, dashboard, and FMSS tracking.

6. Update its policies to require park units to develop procedures for each advanced wastewater system requiring a certified wastewater operator.

   NPS Response: NPS concurred with this recommendation and stated that it "will update policy (Reference Manual 83A) to clarify that park units must develop procedures for certified wastewater operators to operate advanced wastewater treatment systems." On January 29, 2025, NPS provided additional information and updated its target implementation date to April 3, 2026, based on what it described as uncertainties in hiring and policy updates.

   OIG Comment: Based on NPS' initial response and additional information provided, we consider this recommendation resolved. We will consider it implemented once NPS provides evidence demonstrating that it has updated its policy to require advanced wastewater system procedures.

Appendix 1: Scope and Methodology

Scope

Our scope included the National Park Service's (NPS') operations and maintenance of wastewater systems, the degree to which health and safety issues are identified and addressed, and how sludge is treated and handled within NPS' park units. We focused on park units that operate at least one advanced wastewater treatment system or plant, as these parks typically contain other wastewater systems, such as septic tanks, drainfields, vault toilets, and backcountry pit privies Therefore, our sample may not be representative of all wastewater systems in NPS. We did not review deferred maintenance costs, project prioritization processes, or financial incentives related to the production of biosolids.

Methodology

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We assessed whether internal control was significant to the audit objectives. We determined that NPS' control activities and the following related principles were significant to the audit objectives:

- Management should demonstrate a commitment to recruit, develop, and retain competent individuals.
- Management should identify, analyze, and respond to risks related to achieving the defined objectives.
- Management should design the entity's information system and related control activities to achieve objectives and respond to risks.
- Management should implement control activities through policies.
- Management should internally communicate the necessary quality information to achieve the entity's objectives.
- Management should remediate identified internal control deficiencies on a timely basis.

We tested the operation and reliability of internal controls over activities related to our audit objective. Our tests and procedures included:

- Gathering and reviewing background information about the systems used for the treatment and disposal of wastewater.
- Reviewing applicable laws, regulations, and NPS policies regarding the management of wastewater systems.
- Interviewing subject matter experts from the U.S. Environmental Protection Agency to obtain information regarding the regulation of wastewater systems and the handling of sewage sludge and biosolids.

- Interviewing NPS officials, including:
    - Regional facility managers to learn about each region's management of wastewater systems;
    - Office of Public Health (OPH) consultants to learn about their involvement in the inspection of wastewater systems to protect public health and safety;
    - Historic Preservation Training Center staff to understand the wastewater training provided to park personnel;
    - Wastewater engineers involved in the planning, design, and construction of wastewater systems;
    - Park Facilities Management Division staff to gain an understanding of the systems used to track and monitor wastewater system data; and
    - Human Resources Division staff to understand recruitment and retention incentives for wastewater operators.
- Surveying 30 NPS park units that we identified as having advanced wastewater treatment systems or plants within the park, or a unique way of treating wastewater or sewage sludge.
- Obtaining and analyzing a sample of 30 public health assessments conducted by OPH to summarize public health and safety deficiencies and identify any repeated issues.
- Reviewing and analyzing data from NPS' Facility Management Software System (FMSS), Federal Real Property Profile (FRPP), and Office of Public Health Information System (OPHIS) to summarize wastewater assets and determine which park units had wastewater treatment plant(s) on site.

We relied on computer-generated data from FMSS for wastewater systems (asset code 5200) from fiscal years (FYs) 2019 through 2023 and data obtained from OPHIS. Specifically, we used FMSS and condition assessment data to summarize the value, locations, and deferred maintenance of NPS' more than 1,700 wastewater system assets. To identify the 30 NPS park units we surveyed, we relied on data from both OPHIS and FMSS to identify which parks had an advanced wastewater treatment system or plant. We focused on park units that operate at least one wastewater treatment plant; however, we could not reliably obtain a complete list of park units that had onsite wastewater treatment plants because of the various ways these treatment plants are defined in NPS tracking systems. Although NPS' list of park units with wastewater treatment plants was not completely reliable, we considered it to be representative of the population of NPS treatment plants and was reliable for our sampling and survey purposes. To assess the reliability of computer-generated information, we reviewed data from FMSS, OPHIS, and NPS' FRPP and determined the data were sufficient and appropriate for the purposes of this report.

To select park units to visit, we compared wastewater asset data from FMSS, OPHIS, and FRPP with park visitation rates found on the NPS website for FY 2022. We also considered the current replacement value of wastewater systems for each park. Additional considerations included travel costs, accessibility, seasonality, and timing of site visits. Based on these factors, the team conducted site visits to Everglades National Park, Yellowstone National Park, and Yosemite National Park. See Appendix 2 for a list of sites visited.

Through further analysis of FMSS and OPHIS data, interviews with regional facility managers, and coordination with OPH consultants, we identified 30 park units as having a wastewater treatment plant within the park or a unique way of treating their wastewater or sewage sludge. We developed a survey focused on wastewater management, public health and safety, and the processing of sewage sludge and biosolids and sent a questionnaire to those 30 parks. See Appendix 3 for a list of sites surveyed.

Appendix 2: Sites Visited

Everglades National Park	Homestead, FL
Yellowstone National Park	Yellowstone National Park, WY
Yosemite National Park	Yosemite Valley, CA

Appendix 3: Parks Surveyed

Intermountain Region	Big Bend National Park (TX) Glacier National Park (MT) Grand Canyon National Park (AZ) Grand Teton National Park (WY) Mesa Verde National Park (CO) Yellowstone National Park (WY, ID, MT)
Midwest Region	Buffalo National River (AR) Mount Rushmore National Memorial (SD) Isle Royale National Park (MI)
Northeast Region	Acadia National Park (ME) Assateague Island National Seashore (MD, VA) Cape Cod National Seashore (MA) Flight 93 National Memorial (PA) Gateway National Recreation Area (NY) New River Gorge National Park and Preserve (WV) Shenandoah National Park (VA)
Pacific West Region	Mount Rainier National Park (WA) North Cascades National Park (WA) Olympic National Park (WA) Sequoia and Kings National Parks (CA) Whiskeytown-Shasta-Trinity National Recreation Area (CA) Yosemite National Park (CA)
Southeast Region	Blue Ridge Parkway (NC, VA) Dry Tortugas National Park (FL) Everglades National Park (FL) Great Smoky Mountains National Park (NC, TN) Mammoth Cave National Park (KY) Virgin Islands National Park (USVI)
Alaska Region	Denali National Park and Preserve (AK) Glacier Bay National Park (AK)

Appendix 4: Response to Draft Report

The National Park Service's response to our draft report follows on page 25.

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, NW
Washington, DC 20240

January 10, 2025

To: Acting Assistant Inspector General for Audits, Inspection, and Evaluations

From: Director

Subject: National Park Service responses to the Office of Inspector General (OIG) Draft Audit Report titled: The National Park Service Could Improve Management of Wastewater Systems by Remediating Public Health Deficiencies and Updating Inventories and Policies (Report No. 2023-CR-026)

Thank you for the opportunity to review and comment on the subject OIG report. We appreciate OIG's review of the National Park Service (NPS) issues related to management of wastewater treatment systems, ensuring public health and safety and disposal of sewage sludge. Attached are the NPS comments on the subject OIG Draft Audit Report. Below are the responses to the specific recommendations, including the steps the NPS will be taking to address the concern raised.

Recommendation#1-Develop and implement a policy that requires park units to respond to public health assessments, including planned corrective actions and interim mitigation of all level 4 and 5 deficiencies.

Response: Concur - The Office of Health and Safety (OHS) (formerly Office of Public Health) within the Visitor and Resource Protection directorate (VRP) is enhancing the Public Health Information System (PHIS) application to enable park managers to view, understand, and address deficiencies more effectively. The application is being updated to allow park managers to report the status of corrective actions for level 4 and 5 deficiencies. Additionally, we are streamlining deficiency levels to three categories—levels 2, 3, and 4—for better clarity and consistency. To support this update, level three policy, Reference Manual 83A, will be revised to include the new reporting practices, and policies will be updated to ensure parks address critical deficiencies promptly. The OHS is also refining the list of deficiencies to prioritize the most severe public health concerns.

Interim mitigation measures will vary by deficiency type. For some systems, this may mean restricted or discontinued use, while others may continue operating under specific conditions until funding is available for corrective actions. However, acute deficiencies will cease operation immediately when identified at an inspection, with interim solutions implemented to address public health risks.

Responsible Official: CAPT Sara Newman, NPS OHS, VRP

Target Date of Implementation - April 3, 2026

Recommendation#2- Develop and implement a mechanism for tracking and remediating wastewater system deficiencies and public health recommendations reported in Office of Public Health assessments.

Response: Concur - Please refer to the details above. The OHS is working with NPS data developers to create a module within the PHIS. This module will facilitate the tracking of all deficiencies identified during inspections and provide a system for notifying parks of these deficiencies. Additionally, it will enable parks to establish timelines for corrective actions.

Responsible Official: CAPT Sara Newman, NPS OHS, VRP

Target Date of Implementation – April 3, 2026

Recommendation#3-Require Park units to inventory all backcountry pit privies.

Response: Concur - The OHS is working collaboratively with the Park Planning, Facilities and Lands directorate (PPFL) to complete an inventory of all pit privies both in the front country and backcountry.

Responsible Official: Branch Manager Natalya Karamyshev, NPS PPFL

Target Date of Implementation - June 20, 2025

Recommendation#4- Determine whether any backcountry pit privies qualify as large-capacity cesspools and close them as required.

Response: Concur - The NPS will develop guidance on how to evaluate the size and usage of pit privies, criteria for when they must be closed, and track the closure. The OHS will provide guidance from a public health perspective.

Responsible Official: Branch Manager Natalya Karamyshev, NPS PPFL

Target Date of Implementation - June 20, 2025

Recommendation#5- Develop procedures to periodically inventory backcountry pit privies and determine if they are large-capacity cesspools and should be closed.

Response: Concur – The NPS Asset Management Program is currently reviewing and updating its pit privy inventory to accurately identify and categorize facilities that qualify as large-capacity cesspools.

Responsible Official: Branch Manager Natalya Karamyshev, NPS PPFL

Target Date of Implementation - June 20, 2025

Recommendation#6- Update its policies to require park units to develop procedures for each advanced wastewater system requiring a certified wastewater operator.

Response: Concur - The NPS will update policy (Reference Manual 83A) to clarify that park units must develop procedures for certified wastewater operators to operate advanced wastewater treatment systems.

Responsible Official: CAPT Sara Newman, NPS OHS, VRP

Target Date of Implementation - June 20, 2025

Appendix 5: Status of Recommendations

Recommendation	Status	Action Required
2023-CR-026-01 We recommend that the National Park Service (NPS) develop and implement a policy that requires park units to respond to public health assessments, including planned corrective actions and interim mitigation of all level 4 and 5 deficiencies.		
2023-CR-026-02 We recommend that NPS develop and implement a mechanism for tracking and remediating wastewater system deficiencies and public health recommendations reported in Office of Public Health assessments.		
2023-CR-026-03 We recommend that NPS require park units to inventory all backcountry pit privies.	**Resolved**	We will track implementation.
2023-CR-026-04 We recommend that NPS determine whether any backcountry pit privies qualify as large-capacity cesspools and close them as required.		
2023-CR-026-05 We recommend that NPS develop procedures to periodically inventory backcountry pit privies and determine if they are large-capacity cesspools and should be closed.		
2023-CR-026-06 We recommend that NPS update its policies to require park units to develop procedures for each advanced wastewater system requiring a certified wastewater operator.		

OFFICE OF
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