

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020



March 8, 2023

Reply to Attn of: RE-23-039

Mr. Dave Cobrain, Acting Bureau Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: NASA White Sands Test Facility (WSTF) Monthly Environmental Activity Report
for February 2023

Enclosed is the NASA White Sands Test Facility (WSTF) Monthly Environmental Activity Report for February 2023. This reporting format includes an Executive Summary that provides important events/observations as Enclosure 1, a paper copy of the report as Enclosure 2, and a CD-ROM with the report in PDF as Enclosure 3.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or comments concerning this submittal, please contact Amanda Skarsgard of my staff at 575-571-9668.

TIMOTHY
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Timothy J. Davis
Chief, Environmental Office

3 Enclosures

cc:

Mr. Gabriel Acevedo
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Executive Summary

The following summarizes important information associated with NASA White Sands Test Facility (WSTF) environmental program activities in February 2023:

- There were no waste shipments from WSTF in February 2023.
- NASA sampled 34 of 35 groundwater monitoring wells scheduled for February 2023 and scheduled 41 groundwater monitoring wells for sampling in March 2023.
- Because of inadequate flow in the Mid-plume Constriction Area, NASA operated the Mid-plume Interception and Treatment System intermittently in February 2023 for 12 of 28 days, treating 0.28 acre-feet of contaminated groundwater and 180 gallons of investigation-derived waste.
- NASA operated the Plume Front Treatment System on 28 of 28 days in February 2023 and treated 40.0 acre-feet of contaminated groundwater.
- NASA continued addressing NMED's comments on the 200/600 Area vapor intrusion report.
- NASA continued extraction of perched groundwater at monitoring well 600-G-138.
- NASA continued investigation fieldwork necessary to address NMED comments in their disapprovals of all four wastewater lagoon investigation reports.
- NASA received NMED's approval with modifications of the accelerated corrective measures work plan for SWMU 16 and is addressing their comments and planning for future work.
- NASA continued developing the required abandonment reports for the 12 wells abandoned in January 2023. NASA also continued project planning for several additional monitoring well projects.
- NASA continued developing a work plan for Phase 2 of the Targeted Mobile Remediation Process (TMRP).
- NASA submitted five documents to the NMED Hazardous Waste Bureau in February 2023.
- There were no reportable non-compliance issues in February 2023.

National Aeronautics and Space Administration



Monthly Environmental Activity Report
February 2023

Report Deadline: March 15, 2023

NASA Johnson Space Center White Sands Test Facility
Monthly Environmental Activity Report

February 2023

NM8800019434

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

TIMOTHY DAVIS Digitally signed by TIMOTHY DAVIS
Date: 2023.03.08 11:24:27 -07'00'

Timothy J. Davis
Chief, Environmental Office

See Electronic Signature

Date

National Aeronautics and Space Administration

Johnson Space Center
White Sands Test Facility
12600 NASA Road
Las Cruces, NM 88012
www.nasa.gov/centers/wstf

www.nasa.gov

Executive Summary

The following summarizes important information associated with NASA White Sands Test Facility (WSTF) environmental program activities in February 2023:

- There were no waste shipments from WSTF in February 2023.
- NASA sampled 34 of 35 groundwater monitoring wells scheduled for February 2023 and scheduled 41 groundwater monitoring wells for sampling in March 2023.
- Because of inadequate flow in the Mid-plume Constriction Area, NASA operated the Mid-plume Interception and Treatment System intermittently in February 2023 for 12 of 28 days, treating 0.28 acre-feet of contaminated groundwater and 180 gallons of investigation-derived waste.
- NASA operated the Plume Front Treatment System on 28 of 28 days in February 2023 and treated 40.0 acre-feet of contaminated groundwater.
- NASA continued addressing NMED's comments on the 200/600 Area vapor intrusion report.
- NASA continued extraction of perched groundwater at monitoring well 600-G-138.
- NASA continued investigation fieldwork necessary to address NMED comments in their disapprovals of all four wastewater lagoon investigation reports.
- NASA received NMED's approval with modifications of the accelerated corrective measures work plan for SWMU 16 and is addressing their comments and planning for future work.
- NASA continued developing the required abandonment reports for the 12 wells abandoned in January 2023. NASA also continued project planning for several additional monitoring well projects.
- NASA continued developing a work plan for Phase 2 of the Targeted Mobile Remediation Process (TMRP).
- NASA submitted five documents to the NMED Hazardous Waste Bureau in February 2023.
- There were no reportable non-compliance issues in February 2023.

1.0 Waste Management Activities

1.1 There were no waste shipments in February 2023.

2.0 Environmental Monitoring

2.1 NASA performed sampling at 34 of 35 groundwater monitoring wells or zones scheduled for sampling in February 2023 in accordance with the approved Groundwater Monitoring Plan (GMP). NASA rescheduled sampling of well NASA 3 because of sampling equipment failure. Previous deviations from the planned sampling schedule are described below and have been reported to NMED in previous monthly reports:

- Wells 600A-001-GW and 600A-002-GW (scheduled for sampling in November 2022) were not sampled because of equipment failure. NASA obtained replacement sampling equipment in December 2022 for use in January 2023. Upon further evaluation, NASA determined that previous development of these wells using on-site equipment after colloidal borescope tests may have been inadequate. NASA is working to acquire the services of an off-site subcontractor to perform additional development at these wells prior to sampling. NASA will provide an update on well development progress in future monthly reports.
- NASA could not sample well PL-7-480 in August 2022, because the Westbay zone did not produce water. NASA believes the water level at this location has dropped below this sample port and will monitor the water level during future planned sampling events.
- Wells BLM-1-435 (scheduled for sampling in April 2021) and PL-3-453 (scheduled for sampling in December 2020) have not been sampled, because the water levels are not sufficient for sampling. NMED approved NASA's recommendation to plug and abandon these wells. NASA is planning the abandonment and replacement of wells BLM-1-435 and PL-3-453.

2.2 NASA performed other regulatory groundwater sampling requirements as scheduled and as allowed by operational status. NASA did not sample wells PFE-1, PFE-2, PFE-3, and MPE-8, because they were not operational due to equipment failure. NASA continues efforts to resolve these equipment issues and will provide updates in future reports.

2.3 NASA developed the March 2023 groundwater sampling schedule and plans to sample 41 groundwater monitoring wells or zones based on GMP requirements.

3.0 Corrective Actions/Investigations

3.1 Mid-plume Interception and Treatment System Operations

Days Operated	Average Flow Rate (gpm)	Volume Extracted and Treated (acre-feet)	Volume of Groundwater Discharged to Infiltration Basin (acre-feet)	Volume of IDW Treated and Discharged to the Infiltration Basin (gallons)
12 of 28	5.5	0.28	0.27	180

NASA White Sands Test Facility

Shutdown Date	Restart Date	Shutdown Status	Discussion
2/2/23	2/6/23	Planned	NASA shut the system down to allow groundwater to recover in the MPCA.
2/9/23	2/13/23	Planned	NASA shut the system down to allow groundwater to recover in the MPCA.
2/14/23	2/15/23	Planned	NASA shut the system down to accommodate a planned network outage.
2/17/23	2/21/23	Planned	NASA shut the system down to allow groundwater to recover in the MPCA.
2/23/23	2/27/23	Planned	NASA shut the system down to allow groundwater to recover in the MPCA.

3.2 Plume Front Treatment System Operations

Days Operated	Average Flow Rate (gpm)	Volume Extracted/ Treated (acre-feet)	Volume Injected (acre-feet)	Volume Discharged to Grade (acre-feet)	Volume Discharged to Modu-Tank (acre-feet)
28 of 28	329	40.0	38.7	0.13	0.0

Shutdown Date	Restart Date	Shutdown Status	Discussion
2/7/23	2/7/23	Planned	NASA shut the system down to perform planned maintenance activities.
2/22/23	2/22/23	Unplanned	The system automatically shut down due to low flow when well PFE-4A briefly went offline.
2/26/23	2/27/23	Unplanned	The system shut down automatically due to a communication loss at the injection wells.

3.3 200 Area Investigation

- NASA continued evaluating and responding to NMED’s three multipart comments in their September 30, 2022 disapproval of the *NMED Disapproval Response for 200 Area and 600 Area Vapor Intrusion Assessment Report* (January 30, 2020). A revised report is due to NMED no later than April 28, 2023.

3.4 400 Area

- NMED is reviewing the *Response to Disapproval of 400 Area Supplemental Groundwater and Soil Vapor Monitoring Plan* (July 14, 2021), the *NASA WSTF 400 Area Closure Investigation Report – NMED Third Disapproval Response* (July 27, 2021), and the *Response to Disapproval of 300 Area Supplemental Abbreviated Drilling Work Plan* (July 14, 2021).

3.5 600 Area Perched Groundwater Extraction Pilot Test and Investigation

- In February 2023, NASA extracted approximately 83 gallons of perched groundwater from monitoring well 600-G-138 in accordance with NMED's March 1, 2013, *Approval Time Extension for Implementation of the Perched Groundwater Extraction Pilot Test at the 600 Area*. Groundwater elevation measurements indicate there is approximately 3.08 feet of perched groundwater within this well. This perched groundwater thickness has been relatively consistent since the inception of extraction activities in 2013. Extracted groundwater was containerized for treatment at the Mid-plume Interception and Treatment System (MPITS) and discharged in accordance with DP-1255.
- NMED is reviewing the *600 Area Perched Groundwater Investigation Report* (June 29, 2022).

3.6 SWMUs 2, 8, and 34 and AOC 51 (Wastewater Lagoons)

- NASA continued the additional fieldwork necessary to address NMED comments in their disapprovals of the *NASA White Sands Test Facility (WSTF) 200 Area Wastewater Lagoons Closure (SWMU 8) Investigation Report* (November 25, 2019) on June 6, 2022, the *NASA White Sands Test Facility (WSTF) 600 Area Wastewater Lagoons Closure (SWMU 34) Investigation Report* (November 26, 2019) on June 16, 2022, the *NASA White Sands Test Facility (WSTF) 100 Area Wastewater Lagoons Closure (SWMU 2) Investigation Report* (August 3, 2020) on July 5, 2022, and the *NASA White Sands Test Facility (WSTF) STGT Wastewater Lagoons Closure (AOC 51) Investigation Report* (October 13, 2020) on July 25, 2022.
- NASA's subcontracted drilling company continued the installation of soil borings in accordance with the NMED-approved work plan. NASA completed the remaining six soil borings at the 600 Area lagoons, then decontaminated all downhole drilling tools and moved operations to the 200 Area lagoons. NASA and the subcontracted drilling company completed the nine soil borings at the 200 Area lagoons then decontaminated tooling, moved to the 100 Area lagoons, and completed two of the 100 Area lagoons soil borings. The required soil samples were collected at each boring and submitted to the off-site laboratories for analysis.

3.7 SWMU 10 (200 Area Hazardous Waste Transmission Lines [HWTL])

- NMED is reviewing the *Response to Second Disapproval of NASA WSTF 200 Area HWTL (SWMU 10) Investigation Report and Risk Assessment Report* (March 4, 2022).

3.8 SWMU 16 (600 Area BLM Off-site Soil Pile)

- NMED approved the *Accelerated Corrective Measures Work Plan for the NASA WSTF SWMU 16 (600 Area BLM Off-Site Soil Pile)* (September 28, 2021) with modifications on February 10, 2023. NASA is addressing NMED's two comments and revising the work plan for submittal to NMED no later than May 31, 2023.

3.9 SWMUs 21-27 (Septic Tanks)

- NMED is reviewing the *Response to Second Disapproval of NASA White Sands Test Facility (WSTF) Septic Tanks (SWMUs 21-27) Investigation Report* (May 18, 2021).

3.10 SWMUs 29-31 (Small Arms Firing Ranges)

- NMED approved the *Small Arms Firing Ranges (SWMUs 29-31) Remedy Completion Report and Risk Assessment Report* (August 3, 2020). No additional work is planned at these units. NMED and NASA will evaluate their status following issuance of the RCRA Permit.

- 3.11 SWMU 33 (Test Stand 302 Cooling Water Pond)
- NMED is reviewing the *Response to Disapproval of NASA WSTF 300 Area Test Stand 302 Cooling Water Pond (SWMU 33) Investigation Work Plan (IWP) and Historical Information Summary (HIS)* (September 14, 2022).
- 3.12 SWMU 47 (500 Area Fuel Storage)
- NMED is reviewing the *Response to Second Disapproval of 500 Area Fuel Storage (SWMU 47) Investigation Work Plan* (June 29, 2021).
- 3.13 SWMU 49 (700 Area Landfill)
- NMED approved the *700 Area Landfill Closure (SWMU 49) Phase I Investigation Report* (April 29, 2022) on February 10, 2023 and directed NASA to provide a Phase II work plan no later than October 31, 2023.
- 3.14 SWMU 50 (TDRS Diesel Release)
- NMED approved the *First Tracking Data Relay Satellite System (TDRSS) Diesel Release (SWMU 50) Investigation Report and Risk Screen Evaluation Report* (November 9, 2020). No additional work is planned at this unit for the foreseeable future.
- 3.15 Newly Identified SWMU Near 500 Area (Former Oxidizer Burner)
- NMED is reviewing the *500 Area Former Oxidizer Burner (FOB) Investigation Work Plan (IWP) and Historical Information Summary (HIS)* (August 25, 2022).
- 3.16 Groundwater Monitoring Well Abandonment, Installation, and Reconfiguration
- NMED is reviewing the *NASA WSTF Westbay Well Reconfiguration Work Plan for Wells PL-7, PL-8, PL-10, ST-5, and WW-3* (April 29, 2021).
 - Following partial well plugging in January 2023, NASA continued planning the remainder of reconfiguration activities (sampling system installation) at well BW-4. The well reconfiguration report is due to NMED no later than March 30, 2023.
 - Following the abandonment of well NASA 9 in January 2023, NASA continued planning the installation of the replacement well and related abandonment and replacement report, which is due to NMED no later than September 29, 2023.
 - Following the abandonment of the borehole at former well BLM-28 in January 2023, NASA continued developing the well abandonment report for submittal to NMED no later than March 15, 2023.
 - Following the abandonment of the borehole at former well BLM-30 in January 2023, NASA continued planning the installation of the replacement well and related abandonment and replacement report, which is currently due to NMED no later than April 28, 2023.
 - Following the abandonment of wells 200-SG-2 and 200-SG-3 in January 2023, NASA continued developing the well abandonment report for submittal to NMED no later than March 31, 2023.
 - Following the abandonment of wells 400-C-118, 400-LV-125, 400-KV-142, and BLM-2-482 in January 2023, NASA continued preparing the well abandonment reports, which are due to NMED within 90 days of well abandonment.

- Following the abandonment of wells PFE-4 and PFE-6 in January 2023, NASA continued preparing the well abandonment report, which is due to NMED within 60 days of well abandonment in accordance with the GMP.
- NASA continued planning for well installation activities in accordance with NMED's May 2022 approvals of the *NASA WSTF Work Plan for Drilling and Installation of Monitoring Well 600B-001-GW* (BLM-28 replacement; August 31, 2021) and the *Work Plan for Drilling and Installation of Monitoring Well 600C-001-GW at the NASA White Sands Test Facility (WSTF)* (deeper well adjacent to BLM-10-517; August 31, 2021).
- NASA continued planning well installation and abandonment work in accordance with NMED's October 31, 2022 approval of the *NASA WSTF Work Plan for Drilling and Installation of Monitoring Well 600C-002-GW and Abandonment of PL-6* (February 1, 2022).

3.17 Targeted Mobile Remediation Process (TMRP)

- NASA continued development of the proposed TMRP Phase 2 pilot test work plan that is due to NMED no later than April 28, 2023.
- In January 2023, NASA performed investigation fieldwork at well ST-1-541 in accordance with the NMED-approved *Well ST-1-541 Contaminated Groundwater Release Abbreviated Investigation Work Plan* (June 3, 2021). NASA provided soil samples to the off-site analytical laboratory; however, shipping delays caused by winter weather caused the samples to arrive at the laboratory outside of the established holding times and temperatures. NASA collected replacement soil samples in February 2023 and submitted them to the laboratory for analysis. The abbreviated investigation report is due to NMED no later than March 31, 2023.

3.18 Groundwater Data Representativeness Evaluation

- NASA continued developing the investigation report for the NMED-approved groundwater data representativeness investigation (*Abbreviated Investigation Work Plan for Groundwater Data Representativeness, Phase 2: FLUTE Well Evaluation* [November 2, 2021]). The report is due to NMED no later than April 28, 2023.

3.19 Dye Tracer Test Investigation

- NMED is reviewing the *Abbreviated Drilling Work Plan in Response to the NMED Approval with Modification of the Report on Tracer Testing in the WSTF 200/600 Areas and Mid-plume Constriction Area* (December 20, 2022).

3.20 Site-wide Geophysics Investigation

- NMED is reviewing the *Site-wide Geophysical Survey Investigation Report* (November 8, 2022).

3.21 PFAS Monitoring

- In the 2022 update of the Groundwater Monitoring Plan, NASA informed NMED of an ongoing preliminary assessment of PFAS being conducted by NASA Headquarters. The NASA Headquarters contractor for the preliminary assessment performed groundwater sampling at WSTF in April 2022 and provided the samples to their laboratory. Analytical data and the associated assessment report are currently being reviewed within NASA.

4.0 Non-compliance Issues

The NASA Hazardous Waste Permit requires that other non-compliance conditions be reported to NMED. There were no instances of other non-compliance conditions during this reporting period that require notification under the Permit. The criteria for non-compliance reporting in this report (as defined by 40 CFR 270.30 (l)(10) and EPA interpretations at RCRA Faxbacks 13142 and 13686) would be any non-compliance with permit conditions that is not classified as minor recordkeeping, reporting, and similar oversights that were corrected once discovered. Additionally, there were no issues meeting the previously defined criteria (minor items immediately corrected) that were part of a repeating pattern of non-compliance.

5.0 Documents Submitted

5.1 Documents submitted to the Hazardous Waste Bureau in February 2023

- NASA submitted the *White Sands Test Facility (WSTF) Annual Waste Accumulation Areas Location Map* on February 2, 2023.
- NASA submitted the *Fee Assessment for the Site-wide Geophysical Survey Investigation Report* on February 23, 2023.
- NASA submitted the *Fee Assessment for the Abbreviated Drilling Work Plan for the Installation of Monitoring Wells Downgradient of the 200 and 400 Areas* on February 23, 2023.
- NASA submitted the *Periodic Monitoring Report – Fourth Quarter 2022* on February 27, 2023.
- NASA submitted the *Response to Disapproval for NASA White Sands Test Facility (WSTF) Background Groundwater Study Investigation Work Plan* on February 27, 2023.

5.2 Pertinent documents submitted to other NMED bureaus in February 2023

- NASA submitted the *2022 Solid Waste Management Annual Report White Sands Test Facility (WSTF) 700 Area Post-Closure Solid Waste Landfill* to the Solid Waste Bureau on February 2, 2023.
- NASA submitted the *2023 Air Quality Bureau Annual Minor Source Permit Fee* for the NASA White Sands Test Facility (WSTF) to the Air Quality Bureau on February 24, 2023.

5.3 Status of documents previously submitted to the NMED Hazardous Waste Bureau for which additional correspondence was recorded in February 2023

- NASA submitted the *NASA White Sands Test Facility (WSTF) 700 Area Landfill Closure (SWMU 49) Phase I Investigation Report* on April 29, 2022. NASA received NMED's June 8, 2022 fee assessment and invoice for review of the report and provided the \$18,000 review fee on June 28, 2022. NMED approved the Phase I investigation report on February 10, 2023 and directed NASA to submit the proposed Phase II investigation work plan no later than October 31, 2023.
- NASA submitted the *Request for Extension of Time for NASA White Sands Test Facility (WSTF) 100 Area Wastewater Lagoons Closure (SWMU 2) Investigation Report Response to Disapproval* on January 18, 2023. NASA requested that the due date for response to NMED disapproval be extended from January 31, 2023 to May 30, 2023. NMED approved the request on February 10, 2023.

- NASA submitted the *Request for Extension of Time for NASA White Sands Test Facility (WSTF) Second Tracking and Data Relay Satellite Ground Terminal (STGT) Wastewater Lagoons Closure (Area of Concern [AOC] 51) Investigation Report Response to Disapproval* on January 18, 2023. NASA requested that the due date for response to NMED disapproval be extended from February 28, 2023 to May 30, 2023. NMED approved the request on February 10, 2023.
- NASA submitted the *Abbreviated Drilling Work Plan in Response to the NMED Approval with Modification of the Report on Tracer Testing in the WSTF 200/600 Areas and Mid-plume Constriction Area* on December 20, 2022. NASA received NMED's January 23, 2023 fee assessment for review of the work plan and provided the \$6,000 review fee on February 23, 2023.
- NASA submitted the *NASA White Sands Test Facility (WSTF) Background Groundwater Study Investigation Work Plan* on February 18, 2021. NASA received NMED's April 8, 2021 fee assessment and invoice for review of the work plan and provided the \$5,000 review fee on April 21, 2021. NMED disapproved the work plan on May 10, 2022 and directed NASA to address two comments and submit a revised work plan no later than July 29, 2022. NASA submitted the *Response to Disapproval for NASA White Sands Test Facility (WSTF) Background Groundwater Study Investigation Work Plan* on July 29, 2022. NMED approved the work plan with modification on January 19, 2023 and directed NASA to provide a revised report no later than February 28, 2023 and an investigation report no later than June 30, 2023. NASA submitted the *Response to Disapproval for NASA White Sands Test Facility (WSTF) Background Groundwater Study Investigation Work Plan* on February 27, 2023.
- NASA submitted the *Accelerated Corrective Measures Work Plan for the NASA WSTF SWMU 16 (600 Area BLM Off-Site Soil Pile)* on October 28, 2021. NASA received NMED's November 18, 2021 fee assessment and invoice for review of the report and provided the \$9,000 fee for review of the report on December 7, 2021. NMED approved the work plan with modifications on February 10, 2023 and directed NASA to address two NMED comments and submit a revised work plan no later than May 31, 2023. NMED also directed NASA to perform the investigation and submit an investigation work plan no later than July 31, 2024.
- NASA submitted the *Request for Extension of Time for Submittal of NASA WSTF Periodic Monitoring Report – Fourth Quarter 2022* on January 5, 2023. NMED received the request, but was unable to review it prior to the report due date. NMED indicated in subsequent email correspondence that the request for extension to February 28, 2023 would be approved.
- NASA submitted the *Site-wide Geophysical Survey Investigation Report* on November 8, 2022. NASA received NMED's December 7, 2022 fee assessment and invoice for review of the report and provided the \$10,000 review fee on February 23, 2023.
- NASA submitted the *NASA White Sands Test Facility (WSTF) 2023 Soil Vapor Risk Based Concentrations (RBC) Memorandum* on January 26, 2023. NASA received NMED's February 22, 2023 fee assessment and invoice for review of the memo and is processing the fee request.