February 27, 2020
File No. 02219702.00

Mr. Tom Farrell, Manager (cover letter only)
Division of Solid Waste Enforcement
New Jersey Department of Environmental Protection
9 Ewing Street
Trenton, New Jersey 08625-0420

Mr. Jeffery Meyer, Manager
Division of Air Enforcement
Bureau of Air Compliance and Enforcement
New Jersey Department of Environmental Protection
7 Ridgedale Avenue
Cedar Knolls, New Jersey 07927

Subject: February 2020 Progress Report
Keegan Landfill
New Jersey Sports and Exposition Authority
EA ID#: NEA 190001-13317

Dear Mr. Farrell and Mr. Meyer:

On behalf of the New Jersey Sports and Exposition Authority (NJSEA), SCS Engineers (SCS) submits this monthly progress report as required under Section C of the Administrative Consent Order (ACO), NEA19001-13317 (executed on March 21, 2019) for the Keegan Landfill (Landfill). This report summarizes the compliance status and activities performed since the previous progress report was submitted on January 30, 2020.

In an effort to streamline reporting and ensure all information is distributed to all interested parties, this report is also submitted to satisfy the requirements of Condition 14 of the Sanitary Landfill Major Disruption Approval (Disruption Approval), issued on June 27, 2019 and the Modified Sanitary Landfill Major Disruption Approval (Modified Disruption Approval), issued on December 23, 2019.

COMPLIANCE MEASURES AND STATUS

The work progress, summary of problems, activities planned, and required and actual completion dates for each ACO Condition is summarized in the table provided in **Attachment 1**. The work progress, summary of problems, activities planned, and required and actual completion dates for each Disruption Approval Condition is summarized in the table provided in **Attachment 2**. Percent valid data measured at each monitoring station is summarized in **Attachment 3**. Further discussion of the difficulties encountered is provided below.

ACO Difficulties Encountered

Monitoring station equipment maintenance is performed as needed. A summary of equipment maintenance is provided in **Attachment 4**.

Notifications of monitoring station readings greater than 30 ppb for 30 minutes were made to NJDEP as summarized in Exhibit 1 below.

Exhibit 1. Summary of End of December and January Notifications

Monitoring Station	Date
Non-Property Line Monitors	
MS-1	January 30, 31 and February 16
MS-2	None
MS-3	None
At or Near Property Line Monitors	
MS-4	None
MS-5	None
MS-6	None
MS-7	None
MS-8	None

Daily odor monitoring at the site, in accordance with the Monitoring Action Plan (MAP), has not detected any specific areas of stressed vegetation at the Landfill. Cover soil deliveries and improvements continued throughout February.

Data review letters were submitted for MS-1 on January 31, February 1 and 2. These letters are required to be submitted within 48 hours of the exceedance by Reference #11 of the EIP200001.

The second interim flare commenced operation on February 3, 2020. There was a period from February 14 through February 17 when the flare was offline resulting in the notification related to MS-1 on February 16. There were condensate, control panel and communications issues at the second flare that have since been rectified.

There have been no reported flare-related bird injuries this month.

Disruption Permit Difficulties Encountered

A request for extension for the deadline imposed by Condition 13 of the Modified Disruption permit was submitted on February 14 and is included as **Attachment 6**.

EXPLANATION OF NON-COMPLIANCE

ACO Schedule

There were no periods of non-compliance with the ACO during the period of this progress report.

Disruption Permit

We have requested an extension for the deadline imposed by Condition 13 as noted above. There were no other periods of non-compliance with the disruption permit during the period of this progress report.

EVALUATION OF CORRECTIVE MEASURES IMPLEMENTED

ACO Schedule

Since the execution of the ACO on March 21, 2019, the corrective measures implemented include actions intended to minimize intake of waste that may contain gypsum wallboard, placement of daily cover, placement of additional intermediate cover, and minimization of the surface area of the working face. The Landfill is currently not accepting any waste.

Disruption Permit Conditions

As noted in the extension request letter for Condition 13, the sulfur treatment system delivery was delayed due to manufacturer equipment breakdown. The vessels were shipped on Monday and the system will be operational by the extension request deadline.

RECORDED MONTHLY MEASUREMENTS FOR DISRUPTION PERMIT

Surface emissions monitoring (SEM) for methane and hydrogen sulfide is required to be conducted on a monthly basis upon completion of the construction of the gas collection and control system and through completion of the Environmental Improvement Pilot Test (EIPT). Results of the February SEM event are included in **Attachment 5**. A comparison of the February SEM data to the January SEM data is also included in **Attachment 5**.

A signed certification of information form is included in **Attachment 7**. The next report will be submitted on or before April 1, 2020. Please call either of the undersigned with any questions or comments.

Sincerely,

Marcus Scrimgeour, PE
Project Manager
SCS Engineers

Lisa K. Wilkinson, PE
Project Director I
SCS Engineers

cc: R. Clark, NJDEP (hardcopy and electronic copy)
A. Fontana (electronic copy)
M. Gerchman (electronic copy)
S. Shah (electronic copy)
V. Prieto, NJSEA (electronic copy)
T. Marturano, NJSEA (electronic copy)
A. Levy, NJSEA (electronic copy)
C. Sanz, NJSEA (electronic copy)
J. Stewart, Lowenstein (electronic copy)
G. Castano (electronic copy)

Attachment 1

January 2020 Progress Report Summary
Keegan Landfill (NEA190001-13317)

No.	ACO Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
7.a	Submit Monitoring Action Plan (MAP)	On April 1, 2019, MAP was submitted to NJDEP; NJDEP Conditional Approval was received on April 8, 2019; Revised MAP was submitted on April 15, 2019.	None	None; activity is complete	Required: April 1, 2019 Actual: April 1, 2019
7.b	Install/operate continuous H_2S Ambient Air Monitoring System	Eight (8) monitoring stations have been installed and are operational as of May 8th as required.	None.	Continue operation of monitoring stations. Quarterly monitoring report for period from August through October will be submitted.	Required: May 8, 2019 Actual: May 8, 2019
7.c	Notify NJDEP of exceedances or potential to cause odor complaint or air pollution	Notifications were made on January 30 and 31 and February 16 of exceedances of the 30 ppb for 30 minutes based on monitoring station readings.	Data review letters were submitted regarding the exceedances reported on January 30, 31 and Feburary 16.	Continue operation of monitoring stations and reporting of exceedances.	Required: upon completion of 7.b above Actual: on-going
7.d	Take measures to control or eliminate emissions	NJSEA has designed, permited and installed GCCS; Modified Disruption Permit was issued on December 23 and new EIPT was issued on 12/23/2019. Construction of the GCCS system expansion commenced on January 15, 2020. All horizontal collectors and 2nd temporary flare have been installed and are operational.	None	Continue installation of sulfur treatment system.	Required: upon exceedance of Condition 7.c level Actual: Ongoing
7.e	Submit estimate of generation of emission rates for H_2S and other air contaminants	Letter report was submitted on May 29, 2019	None	None; activity is complete	Required: May 30, 2019 Actual: May 29, 2019
7.f	Immediately implement measures to maintain compliance	In accordance with NJSEA letter dated March 29, 2019 to NJDEP, wallboard restrictions have been enforced, additional intermediate soil cover has been placed on the western sideslopes, daily cover has been placed and compacted, and active face is minimized.	None.	No additional waste filling will occur; additional intermediate soil cover and contouring material will be placed.	Required: N/A Actual: In progress
7.g	If compliance not achieved by September 1, 2019, submit proposal for GCCS	NJSEA has designed, permited and installed GCCS; Modified Disruption Permit was issued on December 23 and new EIPT was issued on 12/23/2019. All horizontal collectors and 2nd temporary flare have been installed and are operational.	None	Continue installation of sulfur treatment system.	Required: 30 days from NJDEP notification Actual: West Side GCCS startup occurred on September 5, 2019. Startup of 2nd interim flare occurred on February 3, 2020.

Attachment 2

February 2020 Progress Report Summary
Keegan Landfill (Disruption Permit-13317 and Modified Disruption Permit)

No.	Permit Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
1	Approval limited to installation and operation of 28 vertical gas extraction wells, six horizontal collectors, skid-mounted blower/flare system, condensate management system. Modified Approval for six horizontal collectors, header, 2nd skid-mounted blower/flare and sulfur treatment system.	All work completed related to the Original Disruption Permit is completed. Modified Disruption Permit and new EIPT was issued on December 23, 2019. Construction commenced on January 15, 2020. All horizontal collectors and 2nd temporary flare have been installed and are operational.	None	Installation of the sulfur treatment vessels.	Required: Ongoing Actual: Ongoing
2	All odorous waste shall be loaded directly onto trucks and delivered to working face (at least 2x per day). Non-odorous waste may be placed on grade.	Condition has been complied with.	None	None; excavation and waste relocation activities are complete	Required: Ongoing Actual: Complete
3	Immediate placement of 6 inches of soil over odorous waste at working face; non-odorous waste covered at end of work day, no boring or trench left open overnight	Condition has been complied with.	None	None; excavation and waste relocation activities are complete	Required: Ongoing Actual: Complete
4	Dust Control measures shall be implemented.	Dust control measures have been implemented.	None	Continue to implement dust control measures.	Required: Ongoing Actual: Ongoing
5	Noise control measures shall be implemented.	Noise control measures have been implemented.	None	Continue to implement noise control measures.	Required: Ongoing Actual: Ongoing
6	Comply with air emission standards during disruption activities. Comply with GCCS Construction Odor Control Plan.	The Odor Control Plan has been implemented with the exception of Neutraline application due to below freezing temperatures.	None	None; excavation activities are complete	Required: Ongoing Actual: Complete
7	Vectors shall be controlled by application of cover soil.	No vectors have been observed. Cover soil is applied.	None	Continue to control vectors.	Required: Ongoing Actual: Ongoing
8	Adequate water supply and adequate fire-fighting equipment shall be maintained at the facility.	Adequate water supply and fire-fighting equipment is readily available as appropriate.	None	Continue to have adequate water and fire-fighting equipment available.	Required: Ongoing Actual: Ongoing
9	Cease operations and contact Department should hazardous materials be encountered	No hazardous materials have been encountered during disruption activities.	None	None; excavation activities are complete	Required: Ongoing Actual: Complete
10	Follow OSHA standards and HASP; perform on-site air monitoring	OSHA standards have been observed.	None	Continue to follow OSHA standards and HASP and perform on-site air monitoring	Required: Ongoing Actual: Ongoing
11	Allow Department Inspectors to enter and inspect the facility	Department Inspectors are allowed to enter and inspect the facility	None	Continue to allow Department Inspectors to enter and inspect the facility	Required: Ongoing Actual: Ongoing

February 2020 Progress Report Summary
Keegan Landfill (Disruption Permit-13317 and Modified Disruption Permit)

No.	Permit Condition Description	B. Status of permitting, planning approvals and work progress	C. Difficulties Encountered	D. Activities Planned for next reporting period	E. Required and Actual Completion date
12	Notify Department 72-hours prior to initiation of disruption activities.	Department was notified on January 10, 2020 that construction activities would commence on January 15, 2020.	None	None; activity is complete	Required: 72-hours prior to start Actual: 1/10/2020
13	Install and operate GCCS by September 17, 2019 for the western portion under the Original Disruption Permit and within 60 days of the Modified Disruption Permit for the eastern portion.	Installation complete of work in Original Disruption Permit as described above in Item 1, operation of the GCCS commenced on September 5, 2019. All horizontal collectors and 2nd temporary flare have been installed and are operational.	Delivery of sulfur treatment vessels was delayed; submitted deadline extension request letter on February 14, 2020	Continue with adjustment and monitoring of GCCS. Installation of sulfur treatment system upon receipt of the vessels.	Required: West Side 9/17/2019; East Side 2/23/2020 Actual: West Side Operation commenced 9/5/2019
14	Submit Monthly Progress Reports	This report satisfies this requirement for February 2020.	None	Continue to submit monthly progress reports as required	Required: First of Month Actual: Ongoing
15	Submit a report of Construction Activities at completion of construction	Documentation is ongoing during construction to prepare report following construction completion.	Clarifications of the survey drawings for the 2019 construction were ongoing.	Continue to document construction activities.	Required: 30 days after completion Actual: Initial construction CQA Report 2/27/2020
16	Certify Progress Reports by NJ licensed professional engineer	This report is certified by a NJPE	None	Continue to certify progress reports	Required: Monthly Actual: Ongoing
20	Apply Neutraline or equivalent during disruption activities; data sheet shall be provided prior to use	Documentation on Neutraline product was provided in permit application. Neutraline will not be applied during the current construction work due to cold weather and below freezing temperatures.	None	None; activity is complete	Required: Ongoing Actual: Complete
21	Through completion of EIPT, perform SEM for methane and H2S on a monthly basis along slopes and plateau area	EIPT expires on 3/22/2020	None	SEM data for February 2020 is included in Attachment 5	Required: Monthly, through May 2020 Actual: Ongoing
22	Within 90 days from issuance of Modified Disruption Permit, submit an application for construction and operation of a GCCS for entire landfill	Modified Disruption Permit was issued on December 23 and new EIPT was issued on December 23. Permit application submitted for permanent flare on December 17, 2019. Response to DEP comments submitted on 2/6/2020	None	None	Required: 3/22/2020 Actual: Permit Application Submitted 12/17/19.

Note: Conditions 17, 18 and 19 are general conditions.

Attachment 3

Attachment 3
Keegan Landfill
Monitoring Station Availability

Percent Valid Data				
Station	**1/26/20 - 2/1/20**	**2/2/20 – 2/8/20**	**2/9/20 – 2/15/20**	**2/16/20 - 2/22/20**
MS1	96.6%	96.6%	97.1%	96.1%
MS2	97.1%	96.6%	96.7%	96.6%
MS3	96.7%	96.8%	96.2%	93.9%
MS4	97.1%	97.1%	97.1%	97.1%
MS5	94.1%	97.1%	96.6%	97.1%
MS6	87.4%	95.7%	92.5%	96.0%
MS7	96.7%	96.3%	96.7%	96.7%
MS8	96.7%	96.7%	96.4%	96.3%

Attachment 4

Attachment 4
Keegan Landfill
Monitoring Station Equipment Maintenance Details

Date	# of Hours	Description of Work Done	Explanation of Force Majeure (if applicable)
Sunday, February 2, 2020 HR 1830	2	Restore power to MS-7, Manually restart RTU Modem	GFCI for MS-7 tripped.
Sunday, February 9, 2020 HR 0730	3	Reset surge protector on power strip inside MS-2. Restored power to MS-7 & MS- 8 by recommending extension cords.	Slight surge of power at MS-2 most likely caused surge protector on power strip inside MS-2 to go off. Strong winds, increased tension and blown over vegetation created extra tension on extension cords between power and stations MS-7 & MS-8 causing extension cords to pull apart.
Sunday, February 16, HR 2000	1	Manually zero MS-3	
Monday, February 24, HR 1030	2	Checked power at all stations, manually zeroed MS-6.	

Attachment 5

February 26, 2020
File No. 02219702.00

Mr. Tom Marturano
New Jersey Sports and Exposition Authority
One DeKorte Park Plaza
Lyndhurst, New Jersey 07071

SUBJECT: February Surface Emissions Monitoring
Keegan Landfill

Dear Mr. Marturano:

SCS Engineers performed surface emissions monitoring (SEM) on the Keegan Landfill (Landfill) on February 20 and 21, 2020. Condition 21 of the Modified Sanitary Landfill Major Disruption Approval (Disruption Approval), issued on December 23, 2019, requires SEM for methane and hydrogen sulfide (H_2S) to be performed along the slopes and plateau area of the Landfill on a monthly basis upon completion of the construction of the landfill gas (LFG) collection and control system (GCCS) and through completion of the Environmental Improvement Pilot Test (EIPT). This report presents the data of the February SEM event and includes a comparison of the Feburary SEM event data to the January SEM event data.

This letter is organized as follows:

- Landfill Background
- Monitoring Methodology and Equipment
- Monitoring Results
- Findings and Conclusions
- Recommendations

LANDFILL BACKGROUND

The Keegan Landfill, which is owned by New Jersey Sports and Exposition Authority (NJSEA) and operated by Waste Management, Inc. (WM), is located in the Town of Kearny, Hudson County, New Jersey. The Landfill is approximately 95 acres and accepted primarily construction and demolition (C&D) waste. The Landfill is a single mound-type landfill, constructed atop a historical municipal solid waste (MSW) dump site. The Landfill began receiving C&D waste in 2009. The entire Landfill footprint is surrounded by a bentonite-slurry cutoff wall, which includes a leachate collection system. Collected leachate is pretreated for H_2S prior to discharge to the local sewer system.

The Landfill is bordered on the northeast and east by a freshwater marsh. Industrial facilities are located to the north and south of the Landfill. Industrial facilities also bound the Landfill to the west, but then transitions to residential properties.

Prior SEM reports recommended improvements to daily and intermediate cover procedures, and installation of an active GCCS to address measured surface emissions of methane and H_2S. GCCS installation occurred between July and September 2019, and GCCS startup commenced on

September 5, 2019. An expansion of the GCCS commenced in January 2020 and a second flare commenced operation on February 3, 2020. SEM was performed in September, October, November, December, and January during GCCS operations.

MONITORING METHODOLOGY AND EQUIPMENT

Methodology

While the Landfill is not subject to the SEM requirements of 40 CFR 60: New Source Performance Standards (NSPS), Subpart WWW - Municipal Solid Waste (MSW) Landfills, methane SEM was generally conducted as specified in 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21. Monitoring took place over a SEM route consisting of a serpentine path over the entire Landfill, with monitoring points at 30-meter intervals (see SEM plan in **Attachment 1**). H_2S monitoring was performed at generally the same locations as the methane SEM, and in general accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, except that a monitoring device specifically designed for H_2S detection (i.e., Jerome Model J605) was used.

SEM was conducted at all monitoring points with the tip of the instrument probe about five to ten centimeters (i.e., two to four inches) above the Landfill surface. The SEM events were conducted on days with typical meteorological conditions as defined in CFR 60.755(c)(3). Typical meteorological conditions exclude periods within 24 hours following a rain event greater than 0.25 inches total (per 24-hour period).

Basic meteorological conditions, including temperature, wind speed, rainfall, weather conditions and barometric pressure, were recorded at the start of the monitoring day and recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**. Additional hourly weather data and rainfall conditions from Newark Airport are included in **Attachment 3.**

Monitoring Equipment and Calibration

SEM for methane was conducted using a Thermo-Scientific model TVA 2020 portable flame ionization detector (FID). Equipment type, serial number and pertinent equipment information are recorded on Calibration and Pertinent Data Forms for the FID (see **Attachment 2)**.

A Jerome Model 631X meter (H_2S meter) was utilized for monitoring H_2S. A Jerome Model J605 meter was used for H_2S monitoring in the November, December, and January SEM events and the 631 was used for prior events. The Jerome Model 631X has an upper detection limit of 50 ppm, while the Jerome Model J605 has an upper detection limit of 10 ppm. The equipment type, serial number and certification of calibration for the Jerome meter is provided in **Attachment 2**.

Wind speed and direction during surface emissions monitoring were measured at eight ambient air H_2S detection and anemometer stations positioned around the Landfill. This data is provided on a daily basis to NJSEA and NJDEP, and is not reproduced in this report.

Calibration

Prior to commencement of the SEM event, the FID was calibrated in accordance with the manufacturer's recommended procedures, 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, using zero air and a certified span calibration gas containing 500 ppm methane in air. The procedures for calibration precision and instrument response time checks (see further detail

below) were performed prior to the SEM. A post-monitoring calibration precision check was also performed on the FID at the end of each day of the SEM event.

The gold film sensor of the H_2S meter is inherently stable and does not require frequent field calibration. The H_2S meter is factory-calibrated using laboratory equipment, including NIST traceable permeation tubes. In order to calibrate the H_2S meter, a sophisticated calibration system is required that ensures stability of the calibration gas source, eliminates any pressure in the calibration gas stream, and controls the temperature of the calibration environment, which is included in factory calibration. The factory-calibration certificate for the H_2S meter is included in **Attachment 2**.

Calibration Precision Checks

After the initial calibration of the FID instrument each day, instrument precision was checked by running zero methane calibration gas through the instrument and then switching to the 500 ppm methane calibration gas and recording the reading. Calibration precision checks were performed three times during each calibration event to verify instrument precision. In accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, to be considered successful, the instrument reading during the calibration precision check must be within 10 percent of calibration gas concentration (i.e., 500 ppm±10%). All of the calibration precision checks performed were successful, reading within 10 percent of 500 ppm. Therefore, the instrument precision was deemed to be in compliance with corresponding requirements. Results of FID calibration precision checks are recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**.

In accordance with the manufacturer's recommendations, the H_2S meter was regenerated and zero-adjusted prior to the start of each day of the SEM event and as needed during monitoring.

Instrument Response Time Checks

After the initial calibration of the FID instrument, instrument response time was checked by connecting the FID to the zero methane calibration gas and quickly switching to the 500 ppm calibration gas, and recording the time between switching gases until the instrument reads 90 percent of the calibration gas concentration. This procedure was completed three times during each calibration event to verify instrument response time. In accordance with 40 CFR 60.755 (c) and (d), and 40 CFR 60, Appendix A, Method 21, to be considered successful, the average instrument response time must be within 30 seconds. The calibration response time checks performed were successful, with an average response time less than 30 seconds. Therefore, the instrument response was deemed to be in compliance with corresponding requirements. Results of instrument response checks are recorded on Calibration and Pertinent Data Forms, included in **Attachment 2**.

The H_2S meter was operated with a sampling time of 12 to 53 seconds. This is the manufacturer's recommended operating mode for samples with concentrations ranging between 0.003 and 10 ppm H_2S (full range) for an accuracy of +/- 0.003 ppm at 0.050 ppm.

MONITORING RESULTS

The February 2020 SEM data is provided in **Attachment 4**. A total of 238 points were monitored along the pathway identified on the drawing in **Attachment 1**. Portions of the Landfill surface were not monitored due to heavy equipment operation and dangerous conditions. An additional methane reading on Path 1 was taken and is included in the overall readings count but is not shown on the results Drawings in Attachment 5. The H_2S SEM began at approximately 07:30 and concluded at

approximately 15:45 on February 20. The methane SEM commenced on February 21 at approximately 08:00 and continued to about 15:00.

On February 20, winds were steady, ranging from 7 to 10 mph with a brief increase to 13 mph at the end of the monitoring period, with wind direction generally from the northwest. On February 21, winds were decreasing from 14 to 8 mph with a slight increase at the end of the monitoring period, and wind direction shifting from the north to west-southwest.

We considered 100 ppm as the methane concentration threshold for further consideration regarding surface emissions. Surface methane concentrations greater than 100 ppm were detected at two (2) locations (see blue-highlighted monitoring locations on Drawing 1 in **Attachment 5**). There were no readings above 500 ppm during this monitoring event (see green-highlighted monitoring locations on Drawing 1 in **Attachment 5**). The methane concentrations, by route, are summarized in Table 1 below.

We selected 30 ppb as the threshold for further consideration regarding H_2S surface emissions. H_2S concentrations greater than 30 ppb were detected at 8 locations. Of these, 6 locations had H_2S concentrations greater than 100 ppb. Orange-highlighted stations on the Drawing 6 in **Attachment 5** indicate those locations with H_2S concentrations less than 100 ppb but greater than 30 ppb, and red-highlighted stations are those locations with H_2S concentrations greater than 100 ppb. The H_2S concentrations, by route, are summarized in Table 1 below.

Table 1. February 2020 SEM Event Data Summary.

Measured Parameter	Route 1	Route 2
Average H_2S reading (ppm)	0.003	0.05
Average CH_4 reading (ppm)	2.0	13.9
# H_2S readings >0.030 ppm	1	7
# H_2S readings >0.100 ppm	1	5
% H_2S readings > 0.030 ppm	1%	7%
% H_2S readings >0.100 ppm	1%	5%
# CH_4 readings >100 ppm	0	2
# CH_4 readings >500 ppm	0	0
% CH_4 readings >100 ppm	0%	2%
% CH_4 readings >500 ppm	0%	0%

FINDINGS AND CONCLUSIONS

There was no consistent, significant correlation between surface methane concentrations greater than 100 ppm and surface H_2S concentrations greater than 30 ppb at discrete points.

Table 2 below compares the SEM data for Route 1 from January and February 2020. Additionally, a comparison of the January to February methane and H_2S concentrations are depicted in Drawings 3 and 4 in **Attachment 6**. There is a decrease in the percentage of elevated H_2S readings from January to February, whereas the percentage of elevated methane readings remained about the same.

Table 2. Route 1 SEM Event Data Comparison.

Measured Parameter	January	February
# H_2S readings >0.030 ppm	13	1
# H_2S readings >0.100 ppm	6	1
% H_2S readings > 0.030 ppm	9%	1%
% H_2S readings >0.100 ppm	4%	1%
# CH_4 readings >100 ppm	1	0
# CH_4 readings >500 ppm	0	0
% CH_4 readings >100 ppm	1%	0%
% CH_4 readings >500 ppm	0%	0%

Table 3 below compares the SEM data from Route 2 in January and February 2020. There is a decrease in the percentage of elevated H_2S readings and methane readings from January to February. Posi-Shell was applied to eastern areas of the Landfill in December (see sketch in Attachment 7). Additionally, the second flare and portions of the expanded GCCS were operational during the February 2020 SEM event and both the flare operation and posi-shell likely had an effect on the reduction in methane and H_2S readings.

Table 3. Route 2 SEM Event Data Comparison

Measured Parameter	January	February
# H_2S readings >0.030 ppm	22	7
# H_2S readings >0.100 ppm	10	5
% H_2S readings > 0.030 ppm	16%	7%
% H_2S readings >0.100 ppm	7%	5%
# CH_4 readings >100 ppm	4	2
# CH_4 readings >500 ppm	2	0
% CH_4 readings >100 ppm	3%	2%
% CH_4 readings >500 ppm	1%	0%

RECOMMENDATIONS

The operation of the GCCS, beginning on September 5, 2019, resulted in a significant reduction in surface emissions in the areas of the Landfill influenced by the GCCS. With the operation of the second interim flare and a portion of the GCCS expansion, we have seen another reduction in the surface emissions in the areas of the Landfill influenced by the GCCS. The remaining portions of the GCCS expansion have since been installed and will be operational this week.

Please call to discuss any questions.

Sincerely,

Stephen Ritman
Staff Engineer
SCS Engineers

Lisa K. Wilkinson, PE
Project Director I
SCS Engineers

cc: C. Sanz, NJSEA
A. Levy, NJSEA
J. Stewart, Lowenstein Sandler

Attachment 1

LEGEND:

- PROPERTY LINE
- 30 EXISTING CONTOUR
- VEGETATION LINE
- MW GROUND WATER MONITORING WELL
- MS-4 MONITORING STATION
- 12+00 11+00 10+00 SEM PATH/SAMPLE LOCATION

REFERENCES:

1. FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-18-19, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-18-19. (FILENAME: KEEGAN 2019.DWG)
2. BOUNDARY DEPICTED WAS TAKEN FROM BEST AVAILABLE SOURCES. ALL BEARINGS AND DISTANCES SHOWN WERE DERIVED FROM OR CALCULATED FROM DATA FURNISHED KUCERA INTERNATIONAL BY NJSEA AND SHOULD NOT BE USED AS THE LEGAL BOUNDARY OF RECORD.
3. COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.

100 50 0 100 200
SCALE: 1"=100'

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	3/15/2019
B	ADD PATH 2	4/3/2019
C	SEM PATH 1 & 2 REVISED	9/23/2019
D	SEM PATH 1, 2, TOPO REVISED	10/17/2019
E	DCCS UPDATED	1/31/2020

SHEET TITLE: **SEM SITE PLAN**

PROJECT TITLE: **MONITORING SUPPORT KEEGAN LANDFILL**

CLIENT: **NEW JERSEY SPORTS & EXHIBITION AUTHORITY**
1 DE KORTE PARK PLAZA, POB 640
LYNDHURST, NJ 07071

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, P.C.
4 CENTURY DRIVE SUITE 150 PARSIPPANY, NJ 07054
PH: (845) 357-1510 FAX: (845) 357-1049

PROJ. NO. 02219702.00 | DSN. BY: LKW | DWN. BY: SHY | CHK. BY: LKW | Q/A RVW BY: LKW | APP. BY: LKW

CADD FILE: MONITORING SP

DATE: 3/15/2019

SCALE: AS SHOWN

DRAWING NO. **1** of **1**

Attachment 2

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services, LLC.

SCS Field Services (PA)

Instrument ID 34945693
Description Thermo TVA-1000
Calibrated 2/12/2020

Manufacturer Thermofisher
Model Number TVA-1000
Serial Number 34945693
Location Harrisburg, PA
Customer Name Doug Cordisco

Frequency 6 Months
Status Passed
Temp 74
Humidity 28

Calibration Specifications

Group # 1
Group Name PID
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	ppm	100.00	ppm	98.90	98.90	-1.10%	Pass

Group # 2
Group Name FID
Stated Accy Pct of Reading

Range Acc % 0.0000
Reading Acc % 3.0000
Plus/Minus 0.00

Nom In Val / In Val	In Type	Out Val	Out Type	Fnd As	Lft As	Dev%	Pass/Fail
100.00 / 100.00	ppm	100.00	ppm	101.00	101.00	1.00%	Pass

Test Instruments Used During the Calibration (As Of Cal Entry Date)

Test Instrument ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date	Next Cal Dat Expiration D
NJ ISOBUTYLENE 03/23	ISOBUTYLENE 100PPM	Calgas	100 PPM	DBJ-248-100-12		3/12/2023
NJ-METHANE EBJ-150A-100-2	100 ppm Methane/ Air	GASCO	100 ppm Methane/ Air	EBJ-150A-100-2		4/3/2023

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Timothee Kouassi

ine Environmental Services, LLC. hereby certifies that this instrument is calibrated and functi meet the manufacturer's specifications using NIST traceable standards, or is derived from acce values of physical constants.

INSTRUMENT CALIBRATION REPORT

Pine Environmental Services LLC
92 North Main St, Building 20
Windsor, NJ 08561
Toll-free: (800) 301-9663

Pine Environmental Services, Inc.

Instrument ID	R11419		
Description	Jerome 631-X		
Calibrated	2/17/2020 7:59:16AM		
Manufacturer	Arizona		
Model Number	631-X	**State Certified**	
Serial Number/ Lot Number	631-2614	**Status**	Pass
		Temp °C	22.7
Location	New Jersey		
Department		**Humidity %**	19

Calibration Specifications

Group # 1
Group Name Regen, Zero, and H2S Test
Test Performed: Yes **As Found Result: Pass** **As Left Result: Pass**

Test Instruments Used During the Calibration **(As Of Cal Entry Date)**

Test Standard ID	Description	Manufacturer	Model Number	Serial Number / Lot Number	Last Cal Date/ Opened Date	Next Cal Date / Expiration Date

Notes about this calibration

Calibration Result Calibration Successful
Who Calibrated Martin Konn

All instruments are calibrated by Pine Environmental Services LLC according to the manufacturer's specifications, but it is the customer's responsibility to calibrate and maintain this unit in accordance with the manufacturer's specifications and/or the customer's own specific needs.

Notify Pine Environmental Services LLC of any defect within 24 hours of receipt of equipment
Please call 800-301-9663 for Technical Assistance

SCS FIELD SERVICES

NSPS Surface Emissions Monitoring
Calibration and Pertinent Data Form

Date: 02/21/20 Site: Keegan landfill Job Number: 02219702.00

Technician(s): Doug Cordisco

Weather Observations

Wind Speed: 14 MPH Wind Direction: N Barometric Pressure: 30.49 "Hg

Air Temperature: 23 °F General Weather Conditions: Clear

Calibration Information

Instrument Info Make/Model: TVA1000B Serial No: 34945693

Cal Gas Info	Manufacturer	Lot #	Expiration Date	Concentration
Span Gas:	QED Landtec	4827601	10/1/2021	500 ppm
Zero Gas:	QED Landtec	4828301	10/1/2021	0 ppm

Pre-monitoring Calibration Precision Check

Procedure: Calibrate the instrument. Make a total of three measurements by alternating zero air and the calibration gas. Record the readings and calculate the average algebraic difference between the instrument reading and the calibration gas as a percentage. ***The calibration precision must be less than or equal to 10% of the calibration gas value.***

Trial	Zero Air Reading (ppm)	Cal Gas Reading (ppm)	|Cal Gas Conc. – Cal Gas Reading|
1	0.3	501	1
2	0.3	500	0
3	0.2	500	0
		Average Difference:	0

Calibration Precision = Average Difference / Cal. Gas Conc. X 100%

= 0 / 500 X 100%

= 0.07 %

Pre-monitoring Response Time Check

Procedure: Introduce zero concentration methane/H2S into the instrument. Quickly change to the calibration gas and record stabilized reading. Record the amount of time it took the instrument to read 90 of the stabilized reading. ***This average response time must be less than or equal to 30 seconds.***

Trial	Stabilized Reading on Cal Gas	90% of Stabilized Reading	Time to Reach 90% of Stabilized Reading (Seconds)
1	501	451	10
2	500	450	9
3	~~500~~	450	6
		Average Response Time:	8

Background Concentration Checks

Upwind Location Description: N of site on perimeter road Reading: 1.11 ppm

Downwind Location Description: S of site on perimeter road Reading: 2.34 ppm

Average Background Reading: 1.73 ppm

Post-monitoring Calibration Precision Check

Zero Air Reading: 0.3 ppm Cal Gas Reading: 504 ppm

Notes/Comments:

Attachment 3

40.69 °N, **74.18** °W

Newark, NJ Weather History

47° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION (/WEATHER/US/NJ/NEWARK/KEWR?CM_VEN=LOCALWX_PWSDASH) | CHANGE

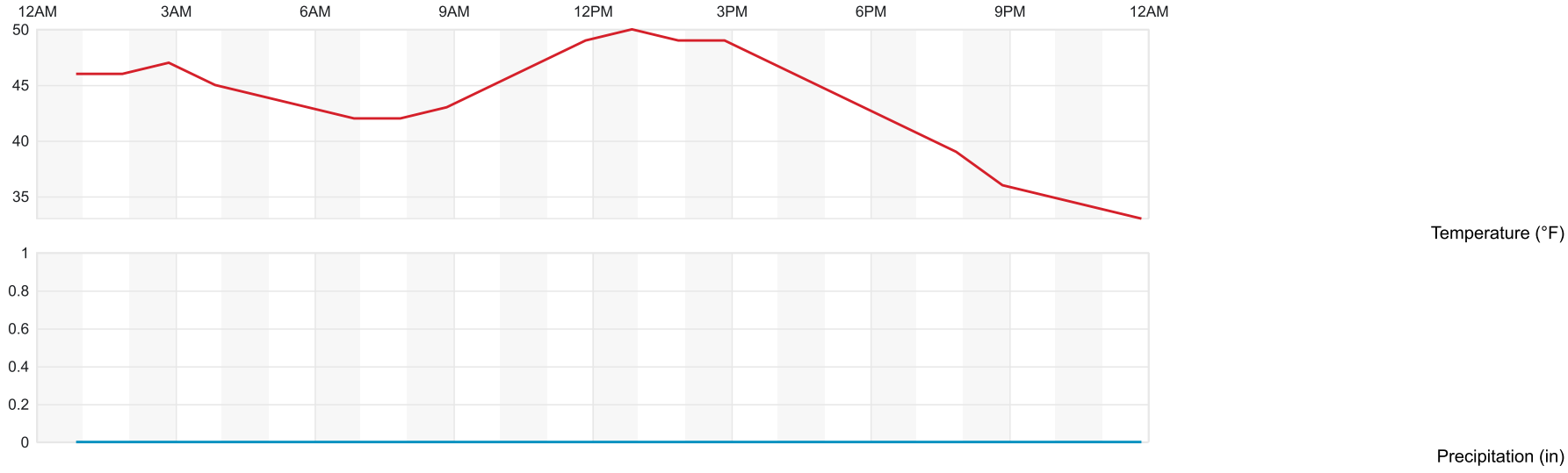
HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)

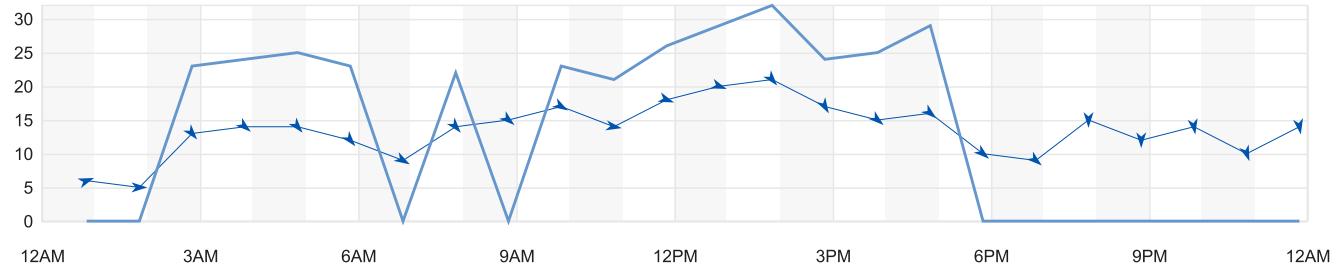
- TODAY (/WEATHER/US/NJ/NEWARK/KEWR)
- HOURLY (/HOURLY/US/NJ/NEWARK/KEWR)
- 10-DAY (/FORECAST/US/NJ/NEWARK/KEWR)
- CALENDAR (/CALENDAR/US/NJ/NEWARK/KEWR)
- HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)
- WUNDERMAP (/WUNDERMAP?LAT=40.69&LON=-74.18)

Daily Weekly Monthly

(/history/daily/us/nj/newark/KEWR/date/2020-2-19) (/history/weekly/us/nj/newark/KEWR/date/2020-2-19) (/history/monthly/us/nj/newark/KEWR/date/2020-2)

February 19 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	50	43	70
Low Temp	33	28	--
Day Average Temp	43.33	35	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 05:51:00)	0.00	0.10	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	20.13	-	-
High	42	-	-
Low	8	-	-
Average	20.13	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	21	-	-
Visibility	10	-	-
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.38	-	-
Astronomy	Day Length	Rise	Set
Actual Time	10h 49m	6:47 AM	5:36 PM

Temperature (° F)	Actual	Historic Avg.	Record
Civil Twilight		6:19 AM	6:04 PM
Nautical Twilight		5:47 AM	6:36 PM
Astronomical Twilight		5:16 AM	7:08 PM
Moon: waning crescent		4:22 AM	1:47 PM

Daily Observations

No Rainfall

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:51 AM	46 °F	42 °F	86 %	WSW	6 mph	0 mph	29.99 in	0.0 in	Cloudy
1:51 AM	46 °F	42 °F	86 %	W	5 mph	0 mph	30.01 in	0.0 in	Cloudy
2:51 AM	47 °F	36 °F	66 %	NW	13 mph	23 mph	30.02 in	0.0 in	Cloudy
3:51 AM	45 °F	30 °F	56 %	NW	14 mph	24 mph	30.07 in	0.0 in	Cloudy
4:51 AM	44 °F	26 °F	49 %	NW	14 mph	25 mph	30.08 in	0.0 in	Cloudy
5:51 AM	43 °F	25 °F	49 %	NW	12 mph	23 mph	30.11 in	0.0 in	Cloudy
6:51 AM	42 °F	24 °F	49 %	WNW	9 mph	0 mph	30.14 in	0.0 in	Mostly Cloudy
7:51 AM	42 °F	22 °F	45 %	NW	14 mph	22 mph	30.17 in	0.0 in	Fair
8:51 AM	43 °F	22 °F	43 %	NW	15 mph	0 mph	30.20 in	0.0 in	Fair
9:51 AM	45 °F	22 °F	40 %	WNW	17 mph	23 mph	30.20 in	0.0 in	Fair
10:51 AM	47 °F	21 °F	36 %	W	14 mph	21 mph	30.20 in	0.0 in	Fair
11:51 AM	49 °F	18 °F	29 %	WNW	18 mph	26 mph	30.19 in	0.0 in	Partly Cloudy
12:51 PM	50 °F	16 °F	26 %	WNW	20 mph	29 mph	30.18 in	0.0 in	Partly Cloudy
1:51 PM	49 °F	12 °F	23 %	NW	21 mph	32 mph	30.19 in	0.0 in	Partly Cloudy / Windy
2:51 PM	49 °F	13 °F	24 %	NNW	17 mph	24 mph	30.20 in	0.0 in	Partly Cloudy
3:51 PM	47 °F	10 °F	22 %	NW	15 mph	25 mph	30.22 in	0.0 in	Mostly Cloudy
4:51 PM	45 °F	8 °F	22 %	NW	16 mph	29 mph	30.24 in	0.0 in	Mostly Cloudy
5:51 PM	43 °F	8 °F	24 %	NW	10 mph	0 mph	30.28 in	0.0 in	Mostly Cloudy
6:51 PM	41 °F	9 °F	27 %	NW	9 mph	0 mph	30.31 in	0.0 in	Mostly Cloudy
7:51 PM	39 °F	13 °F	34 %	N	15 mph	0 mph	30.33 in	0.0 in	Partly Cloudy
8:51 PM	36 °F	15 °F	43 %	N	12 mph	0 mph	30.35 in	0.0 in	Partly Cloudy
9:51 PM	35 °F	16 °F	46 %	N	14 mph	0 mph	30.37 in	0.0 in	Partly Cloudy

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
10:51 PM	34 °F	16 °F	48 %	NNW	10 mph	0 mph	30.37 in	0.0 in	Fair
11:51 PM	33 °F	17 °F	52 %	N	14 mph	0 mph	30.38 in	0.0 in	Fair

40.69 °N, **74.18** °W

Newark, NJ Weather History

47° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION (/WEATHER/US/NJ/NEWARK/KEWR?CM_VEN=LOCALWX_PWSDASH) | CHANGE

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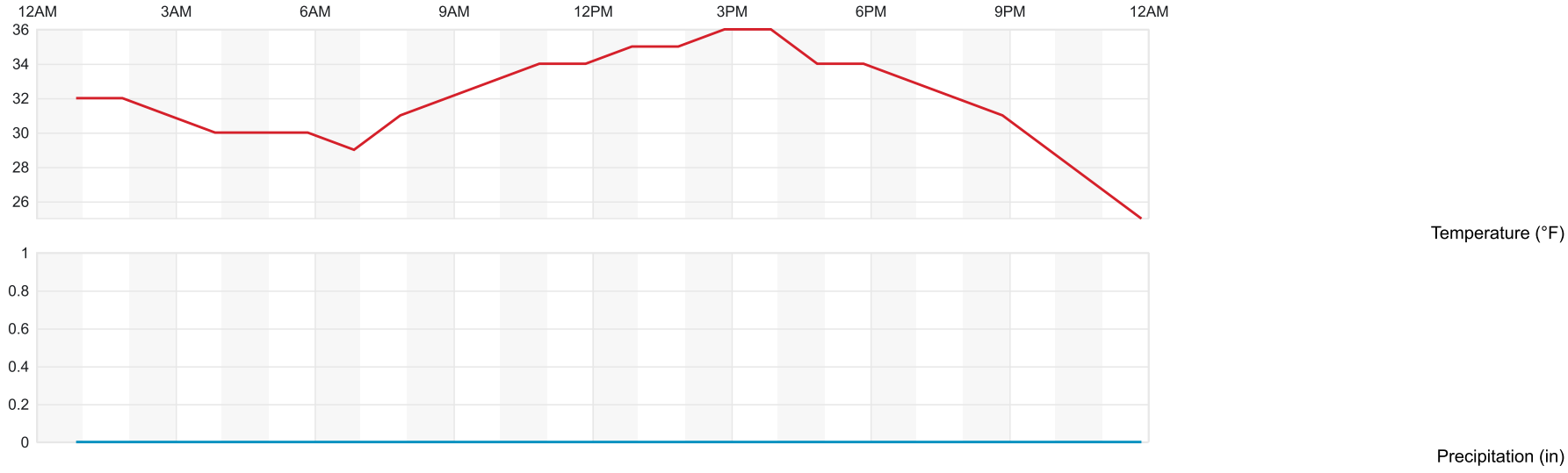
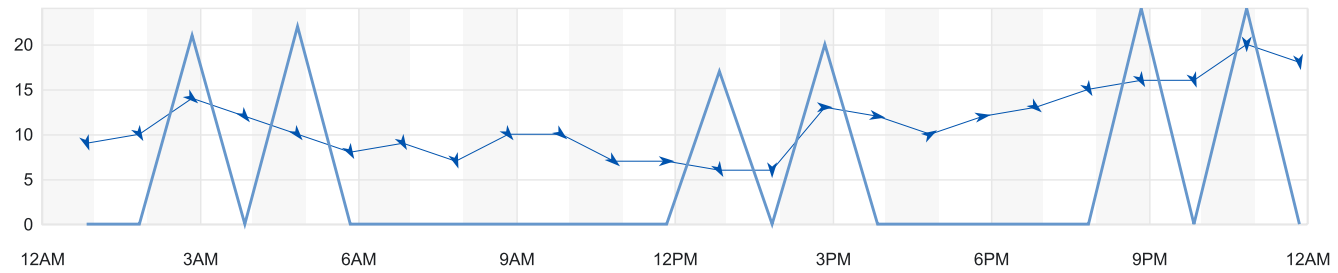
- HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)
- WUNDERMAP (/WUNDERMAP?LAT=40.69&LON=-74.18)

Daily Weekly Monthly

(/history/daily/us/nj/newark/KEWR/date/2020-2-20) (/history/weekly/us/nj/newark/KEWR/date/2020-2-20) (/history/monthly/us/nj/newark/KEWR/date/2020-2)

February 20 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	36	43	70
Low Temp	25	28	1
Day Average Temp	31.88	36	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 05:51:00)	0.00	0.10	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	9.92	-	-
High	17	-	-
Low	6	-	-
Average	9.92	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	20	-	-
Visibility	10	-	-
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.47	-	-
Astronomy	Day Length	Rise	Set
Actual Time	10h 51m	6:46 AM	5:37 PM

Temperature (° F)	Actual	Historic Avg.	Record
Civil Twilight		6:18 AM	6:05 PM
Nautical Twilight		5:46 AM	6:37 PM
Astronomical Twilight		5:14 AM	7:09 PM
Moon: waning crescent		5:12 AM	2:44 PM

Approximate time
H2S SEM

Daily Observations

No Rainfall

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:51 AM	32 °F	17 °F	54 %	NNW	9 mph	0 mph	30.40 in	0.0 in	Mostly Cloudy
1:51 AM	32 °F	16 °F	52 %	NNW	10 mph	0 mph	30.39 in	0.0 in	Mostly Cloudy
2:51 AM	31 °F	15 °F	52 %	NW	14 mph	21 mph	30.40 in	0.0 in	Mostly Cloudy
3:51 AM	30 °F	13 °F	49 %	NW	12 mph	0 mph	30.42 in	0.0 in	Partly Cloudy
4:51 AM	30 °F	12 °F	47 %	NW	10 mph	22 mph	30.43 in	0.0 in	Partly Cloudy
5:51 AM	30 °F	12 °F	47 %	NNW	8 mph	0 mph	30.44 in	0.0 in	Partly Cloudy
6:51 AM	29 °F	12 °F	49 %	NNW	9 mph	0 mph	30.44 in	0.0 in	Mostly Cloudy
7:51 AM	31 °F	12 °F	46 %	NNW	7 mph	0 mph	30.46 in	0.0 in	Mostly Cloudy
8:51 AM	32 °F	12 °F	44 %	NW	10 mph	0 mph	30.47 in	0.0 in	Mostly Cloudy
9:51 AM	33 °F	10 °F	38 %	NW	10 mph	0 mph	30.46 in	0.0 in	Mostly Cloudy
10:51 AM	34 °F	7 °F	32 %	NW	7 mph	0 mph	30.44 in	0.0 in	Cloudy
11:51 AM	34 °F	6 °F	31 %	W	7 mph	0 mph	30.43 in	0.0 in	Cloudy
12:51 PM	35 °F	6 °F	30 %	NNW	6 mph	17 mph	30.41 in	0.0 in	Cloudy
1:51 PM	35 °F	7 °F	31 %	VAR	6 mph	0 mph	30.39 in	0.0 in	Cloudy
2:51 PM	36 °F	8 °F	31 %	W	13 mph	20 mph	30.37 in	0.0 in	Cloudy
3:51 PM	36 °F	8 °F	31 %	W	12 mph	0 mph	30.37 in	0.0 in	Cloudy
4:51 PM	34 °F	9 °F	35 %	WSW	10 mph	0 mph	30.37 in	0.0 in	Cloudy
5:51 PM	34 °F	10 °F	37 %	W	12 mph	0 mph	30.37 in	0.0 in	Mostly Cloudy
6:51 PM	33 °F	10 °F	38 %	NW	13 mph	0 mph	30.41 in	0.0 in	Mostly Cloudy
7:51 PM	32 °F	9 °F	38 %	NNW	15 mph	0 mph	30.41 in	0.0 in	Mostly Cloudy
8:51 PM	31 °F	6 °F	35 %	NNW	16 mph	24 mph	30.42 in	0.0 in	Mostly Cloudy
9:51 PM	29 °F	6 °F	38 %	NNW	16 mph	0 mph	30.43 in	0.0 in	Mostly Cloudy

40.69 °N, **74.18** °W

Newark, NJ Weather History

47° NEWARK LIBERTY INTERNATIONAL AIRPORT STATION (/WEATHER/US/NJ/NEWARK/KEWR?CM_VEN=LOCALWX_PWSDASH) | CHANGE

HISTORY (/HISTORY/DAILY/US/NJ/NEWARK/KEWR)

- TODAY (/WEATHER/US/NJ/NEWARK/KEWR)
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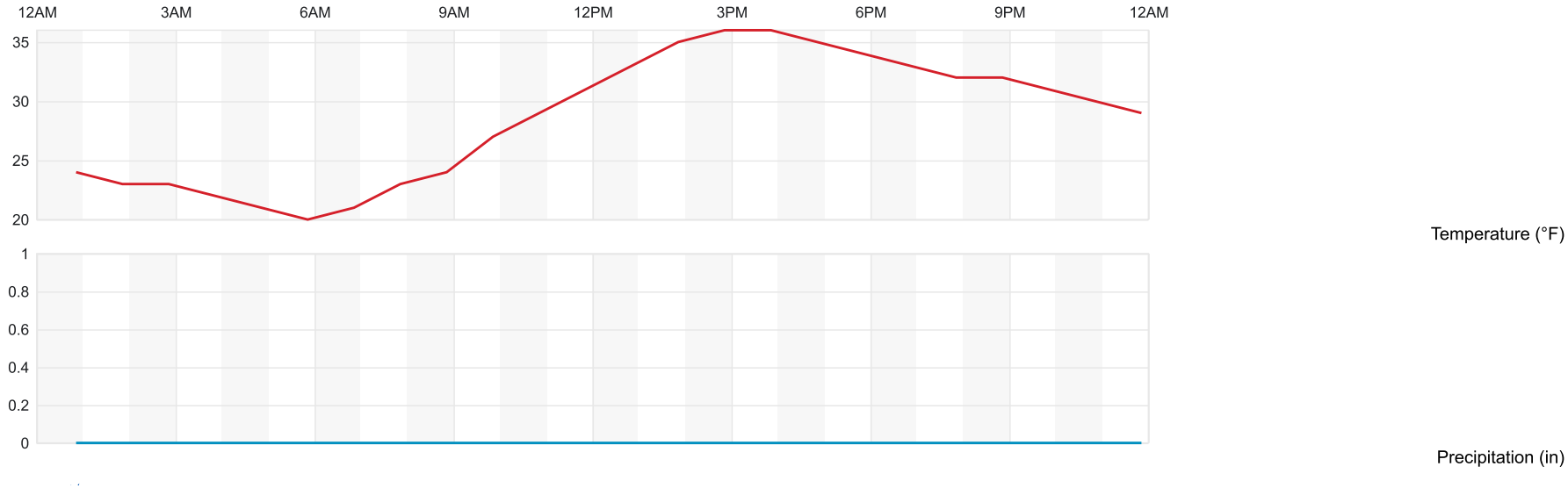
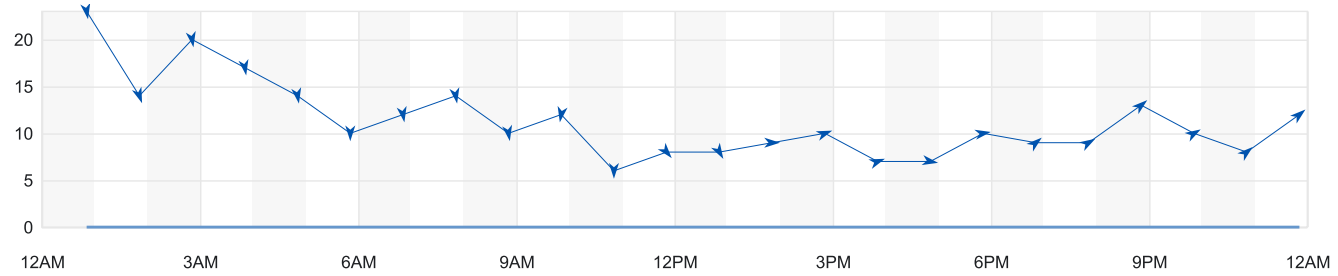
Daily Weekly Monthly

(/history/daily/us/nj/newark/KEWR/date/2020-2-21) (/history/weekly/us/nj/newark/KEWR/date/2020-2-21) (/history/monthly/us/nj/newark/KEWR/date/2020-2)

February 21 2020 View





Summary

Temperature (° F)	Actual	Historic Avg.	Record
High Temp	36	44	81
Low Temp	20	28	3
Day Average Temp	28.5	36	-
Precipitation (Inches)	Actual	Historic Avg.	Record
Precipitation (past 24 hours from 05:51:00)	0.00	0.11	-
Dew Point (° F)	Actual	Historic Avg.	Record
Dew Point	3.71	-	-
High	8	-	-
Low	-3	-	-
Average	3.71	-	-
Wind (MPH)	Actual	Historic Avg.	Record
Max Wind Speed	23	-	-
Visibility	10	-	-
Sea Level Pressure (Hg)	Actual	Historic Avg.	Record
Sea Level Pressure	30.5	-	-
Astronomy	Day Length	Rise	Set
Actual Time	10h 54m	6:44 AM	5:39 PM

Temperature (° F)	Actual	Historic Avg.	Record
Civil Twilight		6:16 AM	6:06 PM
Nautical Twilight		5:45 AM	6:38 PM
Astronomical Twilight		5:13 AM	7:10 PM
Moon: waning crescent		5:54 AM	3:44 PM

Approximate time
CH4 SEM

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
12:51 AM	24 °F	5 °F	44 %	N	23 mph	0 mph	30.44 in	0.0 in	Fair / Windy
1:51 AM	23 °F	5 °F	46 %	NNW	14 mph	0 mph	30.45 in	0.0 in	Fair
2:51 AM	23 °F	5 °F	46 %	N	20 mph	0 mph	30.44 in	0.0 in	Fair
3:51 AM	22 °F	5 °F	48 %	N	17 mph	0 mph	30.44 in	0.0 in	Fair
4:51 AM	21 °F	6 °F	53 %	N	14 mph	0 mph	30.44 in	0.0 in	Fair
5:51 AM	20 °F	6 °F	55 %	N	10 mph	0 mph	30.45 in	0.0 in	Fair
6:51 AM	21 °F	7 °F	55 %	N	12 mph	0 mph	30.46 in	0.0 in	Fair
7:51 AM	23 °F	8 °F	53 %	N	14 mph	0 mph	30.49 in	0.0 in	Fair
8:51 AM	24 °F	7 °F	48 %	N	10 mph	0 mph	30.49 in	0.0 in	Fair
9:51 AM	27 °F	6 °F	41 %	N	12 mph	0 mph	30.50 in	0.0 in	Fair
10:51 AM	29 °F	4 °F	35 %	N	6 mph	0 mph	30.50 in	0.0 in	Fair
11:51 AM	31 °F	3 °F	31 %	NW	8 mph	0 mph	30.49 in	0.0 in	Fair
12:51 PM	33 °F	0 °F	24 %	NNW	8 mph	0 mph	30.46 in	0.0 in	Fair
1:51 PM	35 °F	-3 °F	20 %	W	9 mph	0 mph	30.44 in	0.0 in	Fair
2:51 PM	36 °F	-2 °F	20 %	WSW	10 mph	0 mph	30.41 in	0.0 in	Fair
3:51 PM	36 °F	0 °F	22 %	WSW	7 mph	0 mph	30.40 in	0.0 in	Fair
4:51 PM	35 °F	-1 °F	22 %	W	7 mph	0 mph	30.40 in	0.0 in	Fair
5:51 PM	34 °F	1 °F	25 %	W	10 mph	0 mph	30.39 in	0.0 in	Fair
6:51 PM	33 °F	3 °F	28 %	SW	9 mph	0 mph	30.39 in	0.0 in	Fair
7:51 PM	32 °F	5 °F	32 %	WSW	9 mph	0 mph	30.39 in	0.0 in	Fair
8:51 PM	32 °F	5 °F	32 %	SW	13 mph	0 mph	30.39 in	0.0 in	Fair
9:51 PM	31 °F	4 °F	32 %	WSW	10 mph	0 mph	30.37 in	0.0 in	Fair

Attachment 4

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
0	0	0.88	
1	0	0.55	
2	0	1.14	
3	0	1.09	
4	0	1.57	
5	0	1.4	
6	0	1.36	
7	0	1.66	
8	0	0.96	
9	0	1.03	
10	0	1.05	
11	0	1.12	
12	0	1.2	
13	0.001	0.68	
14	0	1.04	
15	0	0.96	
16	0	1.13	
17	0	1.4	
18	0	0.97	
19	0	1	
20	0	1.08	
21	0	1.21	
22	0	1.37	
23	0.001	0.73	
24	0.001	0.82	
25	0	1.17	
26	0	1.2	
27	0	1.09	
28	0	1.27	
29	0	1.43	
30	0	1.22	
31	0.001	0.96	
32	0.001	1.01	
33	0	0.99	
34	0	1.1	
35	0	1.44	
36	0.001	1.32	
37	0.002	1.17	
38	0	1.2	
39	0.007	3.28	
40	0.001	5.59	

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
41	0	1.66	
42	0.003	1.74	
43	0	12.32	
44	0	6.7	
45	0	13.01	
46	0	5.5	
47	0	7.84	
48	0	1.26	
49	0	4.34	
50	0	3.67	
51	0	1.26	
52	0	1.22	
53	0	1.16	
54	0	1.48	
55	0	0.81	
56	0	1.04	
57	0	1.88	
58	0	1.34	
59	0	1.28	
60	0	1.94	
61	0	1.37	
62	0	0.79	
63	0	1.03	
64	0	0.94	
65	0	0.9	
66	0	1.07	
67	0	1.02	
68	0	0.88	
69	0	0.97	
70	0	1.22	
71	0	1.14	
72	0	1.08	
73	0	1.02	
74	0	0.95	
75	0.001	1.23	
76	0	1.1	
77	0	0.97	
78	0	0.92	
79	0	1.01	
80	0	1.76	
81	0	1.32	
82	0	1.48	

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
83	0	1.05	
84	0	1.11	
85	0	1.17	
86	0.001	1.46	
87	0	1.34	
88	0	1.42	
89	0	1.03	
90	0	1.28	
91	0	1.07	
92	0	0.98	
93	0	1.02	
94	0	1.16	
95	0	1.27	
96	0	1.39	
97	0	1.47	
98	0	1.86	
99	0	2.26	
100			No readings due to truck traffic and dirt compacting operation
101			
102			
103			
104			
105			
106			
107			
108	0	2.43	
109	0	2.8	
110	0.001	2.61	
111	0	1.53	
112	0.002	2.01	
113	0.001	2.1	
114	0.001	2.17	
115	0.001	1.81	
116	0	1.79	
117	0.33	1.27	
118	0	1.32	
119	0	1.77	
120	0	2.29	
121	0	1.84	
122	0	1.33	
123	0	8.67	
124	0	5.89	

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 1
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
125	0	10.23	
126	0	21.87	
127	0	2.42	
128	0	3.47	
129	0	2.21	
130	0	2.17	
131	0	2.54	
132	0	2.1	
133	0	1.72	
134	0	1.59	
135	0	1.45	
136	0	1.53	
137	0	1.43	
138	0	2.36	
139	0	1.22	
140	0	1.01	
141	0	0.92	
142	0	1.33	
Minimum	**0.0**	**0.6**	
Maximum	**0.33**	**22**	
Average	**0.00**	**2.0**	

0.035	
0.12	
Methane > 100 ppm	101
Methane > 500 ppm	501

Notes:
(1) H2S monitoring performed on 2/20/2020 from 7:30 to 15:45
(2) CH4 monitoring performed on 2/21/2020 from 8:00 to 15:00

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
0	0.003	20.31	
1	0.105	2.41	
2	0.013	6.47	
3	0	288	
4	0	11.43	
5	0	14.82	
6	0.003	34.9	
7	1.6	31.89	
8	1.4	20.34	
9	0.006	9.78	
10	0.008	6.53	
11	0	13.39	
12	0	3.73	
13	0	4.71	
14	0	2.98	
15	0	1.55	
16	0	2.97	
17	0	3.43	
18	0	6.7	
19	0	3.39	
20	0.003	1.76	
21	0.007	4.39	
22	0	60.02	
23	0	37.9	
24	0	7.05	
25			No readings due to dirt piles
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37	0	8.23	
38	0.003	26.94	
39			

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
40			No readings due to truck traffic and large dirt piles
41			
42			
43			
44			
45			
46			
47			
48			
49			
50	0.001	3.43	
51	0	2.02	
52	0.002	333	
53	0.008	4.97	
54	0.001	2.59	
55	0.01	3.27	
56	0.002	5.43	
57	0.001	2.94	
58	0	2.71	
59	0	5.89	
60	0.09	46.5	
61	0.002	34.76	
62	0.001	11.39	
63	0	12.71	
64	0	6.64	
65	0	2.7	
66	0	3.5	
67			No readings due to truck traffic and large dirt piles
68			
69			
70			
71			
72			
73			
74			
75		2.9	
76		1.34	
77	0	2.47	
78	0	1.72	
79	0.004	2.13	

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
80	0.001	2.55	
81	0	7.81	
82	0	7.9	
83	0.006	55.29	
84	0.002	4.27	
85	0.002	19.83	
86	0	8.12	
87	1.1	3.35	
88	0.001	20.24	
89	0.003	6.71	
90	0.07	9.41	
91	0.009	37.25	
92	0.003	8.93	
93	0.113	14	
94	0.002	1.8	
95	0	2.16	
96	0	2.38	
97	0	1.86	
98	0	1.42	
99	0	1.51	
100	0	1.35	
101	0	1.28	
102	0	1.35	
103	0	1.16	
104	0	1.23	
105	0.001	1.29	
106	0	1.72	
107	0	1.43	
108	0	1.54	
109	0	1.39	
110	0	9.02	
111	0	1.66	
112	0	1.53	
113	0	1.49	
114	0	1.52	
115	0	1.56	
116	0	4.51	
117	0.001	2.53	
118	0	1.36	
119	0	1.54	

Surface Emission Monitoring Results
February 20 and 21, 2020 Event-Route 2
Keegan Landfill

Monitoring Location (x100')	H2S Concentration (ppm) [1]	CH4 Concentration (ppm) [2]	Comments
120	0	1.78	
121	0	2.6	
122	0	2.33	
123	0	4.11	
124	0.001	3.82	
125	0	1.95	
126	0	1.81	
127	0	1.44	
128	0	1.5	
129	0	2.44	
130	0	1.62	
131	0	1.54	
132	0	2.39	
133			
134			
Minimum	**0.00**	1.16	
Maximum	**1.60**	333	
Average	**0.05**	13.9	

0.035	
0.12	
Methane > 100 ppm	101
Methane > 500 ppm	501

Notes:
(1) H2S monitoring performed on 2/20/20 from 7:30 to 15:45
(2) CH4 monitoring performed on 2/21/20 from 8:00 to 15:00

Attachment 5

CH_4 Concentrations (ppm)

- <100
- 100-500
- >500

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes CH_4 concentration.

Keegan Landfill

February 2020 SEM Event

CH_4 Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00 | February 2020

H_2S Concentrations (ppm)

- <0.030
- 0.030-0.100
- >0.100

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Extenor label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

February 2020 SEM Event

H_2S Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

February 2020

Attachment 6

January 2020

February 2020

CH_4 Concentrations (ppm)

- <100
- 100-500
- >500

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

January / February 2020

CH_4 Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

February 2020

January 2020

February 2020

H_2S Concentrations (ppm)

- <0.030
- 0.030-0.100
- >0.100

Notes:
1. Aerial Imagery from Google Satellite Imagery (2018)
2. Exterior label denotes Monitoring Location.
3. Interior label denotes H_2S concentration.

Keegan Landfill

January / February 2020

H_2S Concentrations

SCS ENGINEERS

SCALE: 0 150 300 450 600 ft

File No. 02219702.00

February 2020

Attachment 7

LEGEND:

- PROPERTY LINE
- EXISTING CONTOUR
- VEGETATION LINE
- GROUND WATER MONITORING WELL
- MONITORING STATION
- SEM PATH/SAMPLE LOCATION

MS-1 MS-2 MS-3 MS-4 MS-5 MS-6 MS-7 MS-8

MW 1 MW 2 MW 3 MW 4 MW 5 MW 7 MW 8

END1 141+33

START 1 0+00

START 2 0+00

END 2 133+50

W.E. 2.1

BRUSH

SCALES

EW19-01 EW19-02 EW19-03 EW19-04 EW19-05 EW19-06 EW19-07 EW19-08 EW19-09 EW19-10 EW19-11 EW19-12 EW19-13 EW19-14 EW19-15 EW19-16 EW19-17 EW19-18 EW19-19 EW19-20 EW19-21 EW19-22 EW19-23 EW19-24 EW19-25 EW19-26 EW19-27

HC19-01 HC19-02 HC19-03N HC19-03S HC19-04N HC19-04S HC19-05 HC19-06 HC19-07

LP

100 50 0 100 200

SCALE: 1"=100'

REFERENCES:

1. FEATURES DEPICTED BASED ON DRAWING ENTITLED 'EXISTING TOPOGRAPHY, KEEGAN LANDFILL' DATE OF AERIAL FLIGHT IS 03-18-19, PREPARED BY KUCERA INTERNATIONAL INC., DATED 3-18-19.
2. (FILENAME: KEEGAN 2019.DWG)
3. BOUNDARY DEPICTED WAS TAKEN FROM BEST AVAILABLE SOURCES. ALL BEARINGS AND DISTANCES SHOWN WERE DERIVED FROM OR CALCULATED FROM DATA FURNISHED KUCERA INTERNATIONAL BY NJSEA AND SHOULD NOT BE USED AS THE LEGAL BOUNDARY OF RECORD.
4. COORDINATE AND ELEVATION DATA FOR MONITORING WELLS WERE PROVIDED BY NJSEA.

NO.	REVISION	DATE
A	ISSUED FOR CLIENT REVIEW	3/15/2019
B	ADD PATH 2	4/3/2019
C	SEM PATH 1 & 2 REVISED	9/23/2019
D	SEM PATH 1, 2, TOPO REVISED	10/17/2019

SHEET TITLE: **SEM SITE PLAN**

PROJECT TITLE: **MONITORING SUPPORT KEEGAN LANDFILL**

CLIENT: **NEW JERSEY SPORTS & EXHIBITION AUTHORITY**
1 DE KORTE PARK PLAZA, POB 640
LYNDHURST, NJ 07071

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
4 EXECUTIVE BLVD, SUITE 3, SUFFERN, NY 10901
PH. (845) 357-1510 FAX. (845) 357-1049

PROJ. NO. 02219702.00
DSN. BY: LKW
DWN. BY: SHY
CHK. BY: LKW
Q/A RVW BY: LKW
APP. BY: LKW

CADD FILE: MONITORING SP

DATE: 3/15/2019

SCALE: AS SHOWN

DRAWING NO. 1 of 1

Attachment 6

February 14, 2020
File No. 02219702.00

Mr. Anthony Fontana, Bureau Chief
Division of Solid and Hazardous Waste
Bureau of Solid Waste Permitting
New Jersey Department of Environmental Protection
401 East State Street
PO Box 420, Mail Code 401-02C
Trenton, New Jersey 08626

Subject: Extension Request for Sulfur Treatment System
Modified Disruption Approval
Keegan Landfill
New Jersey Sports and Exposition Authority
EA ID#: NEA 190001-13317

Dear Mr. Fontana:

On behalf of the New Jersey Sports and Exposition Authority (NJSEA), SCS Engineers (SCS) requests an extension of the deadline for installation and operation of the sulfur treatment system, as specified in the Modified Sanitary Landfill Major Disruption Approval (Modified Approval), issued on December 23, 2019 for the Keegan Landfill (Landfill). The Modified Approval permitted the expansion of the gas collection and control system (GCCS) onto the east side of the Landfill, the installation of a second utility flare, and installation of a sulfur treatment system, in order to enhance the effectiveness of the GCCS to control odors.

Condition 13 of the Modified Approval requires construction and initial operation of the GCCS expansion within sixty (60) days of issuance of the Modified Approval, or February 21, 2020. Construction of the GCCS expansion commenced on January 15, 2020. To date, four (4) horizontal collectors (out of six), the 10-inch loop header, and the second utility flare are installed and operational. The remaining two (2) horizontals are expected to be connected and operational by the February 21, 2020 deadline. The sulfur treatment system will not be fully installed and operational by the deadline, for the following reasons.

In early January 2020, NJSEA decided to install and operate the permanent sulfur treatment system as opposed to the pilot scale system, due to construction schedule and equipment availability. This change allows all the piping and connections for the sulfur treatment system to be installed once and will streamline the installation and operation of the permanent, enclosed flare system. However, the sulfur treatment vessel manufacturing has been unexpectedly delayed, due to equipment breakdown. The sulfur treatment vessels are not expected to ship to the site until February 21. As such, we request an extension until March 13, 2020 to receive shipment of the vessels, offload the vessels, install the piping and instrumentation, and load the media into the vessels.

Please call either of the undersigned with any questions or comments.

Sincerely,

Lisa K. Wilkinson, PE
Project Director I
SCS Engineers

Gregory P. McCarron, PE
Project Director II
SCS Engineers

cc: T. Farrell, NJDEP (electronic copy)
R. Clark, NJDEP (electronic copy)
J. Meyer, NJDEP (electronic copy)
K. Ratzman, NJDEP, Air Division (electronic copy)
Q. Qayyum, NJDEP, Air Division (electronic copy)
S. Shah, NJDEP, DSHW (electronic copy)
G. Castano (electronic copy)
T. Marturano, NJSEA (via email)
A. Levy, NJSEA (via email)
C. Sanz, NJSEA (via email)
J. Stewart, Lowenstein (via email)

Attachment 7

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
CERTIFICATION OF INFORMATION

Facility ID **Keegan Landfill, NEA190001-13317; SW Facility ID No. 133571**
COMPANY **New Jersey Sports & Exposition Authority**

1. Responsible Official - This first tier of this certification is to be signed by the responsible official as defined at N.J.A.C 7:27-1.4

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attached documents and, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Christine Sanz** Title **Senior Vice President/Chief Operating Officer**

Signature _____ Date 2/27/2020

2. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Lisa K. Wilkinson** Title **SCS Engineers Project Director (Consultant)**

Signature _____ Date 2/27/2020

3. Individual(s) with direct knowledge of and responsibility for the information contained in the certified document (N.J.A.C. 7:27-1.39(a)1)

A. "I certify under penalty of law that I believe the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties, including the possibility of fine or imprisonment or both, for submitting false, inaccurate or incomplete information."

Name (type or print) **Marcus M. Scrimgeour, PE** Title **SCS Engineers Project Manager (Consultant)**

Signature _____ Date 2/27/2020